

BLUE EARTH COUNTY HIGHWAY DEPARTMENT
35 MAP DRIVE, MANKATO, MINNESOTA 56001

*****PROPOSAL*****

FOR HIGHWAY CONSTRUCTION
AND MAINTENANCE PROJECTS WITH
BIDS RECEIVED UNTIL 1:30 O'CLOCK P.M. ON JULY 8, 2011

PROPOSAL OF

(NAME OF FIRM)

(ADDRESS)

(AREA CODE) TELEPHONE NUMBER

TO FURNISH AND DELIVER ALL MATERIALS AND TO PERFORM ALL WORK IN ACCORDANCE WITH
"STANDARD SPECIFICATIONS FOR CONSTRUCTION", 2005 EDITION, EXCEPT AS STATED
OTHERWISE IN THE SPECIAL PROVISIONS WHICH ARE PART OF THIS PROPOSAL, FOR

COUNTY PROJECT NO.

C.P. 102

LOCATION: Red Jacket Trail Bridge Trestle over the Le Sueur River

TYPE OF WORK: Bridge #6961, South Pier Replacement & Erosion Stabilization

LENGTH: NA

STARTING DATE: See Special Provisions

COMPLETION DATE: See Special Provisions

NOTICE TO BIDDERS: In submitting a bid, you must return this complete proposal. You must initial
changes made in the Schedule of Prices in the Proposal and
acknowledge addenda on the back cover sheet.

I certify that this Proposal was prepared by me or under my direct supervision, and that I am a licensed
professional engineer under the laws of the State of Minnesota.

BID RIGGING IS A SERIOUS CRIME. IF YOU HAVE ANY INFORMATION CONCERNING COLLUSIVE
BIDDING, EVEN A REQUEST TO SUBMIT A COMPLIMENTARY BID, PLEASE CALL THE MINNESOTA
ATTORNEY GENERAL'S OFFICE AT TELE. NO. 651-296-1796

License Number 14720 Date: 6/2 June 11

To Blue Earth County Board of Commissioners:

According to the advertisement of Blue Earth County inviting proposals for the improvement of the section of highway hereinbefore named, and in conformity with the Contract, Plans, Specifications and Special Provisions pertaining thereto, all on file in the office of the Auditor/Clerk of Blue Earth County:

(I)(We) hereby certify that (I am)(we are) the only person(s) interested in this proposal as principal(s); that this proposal is made and submitted without fraud or collusion with any other person, firm or corporation at all; that an examination has been made of the site of the work and the Contract form, with the Plans, Specifications and Special Provisions for the improvement.

(I)(We) understand that the quantities of work shown herein are approximate only and are subject to increase or decrease; that all quantities of work, whether increased or decreased within the limits specified in Mn/DOT 1903, are to be done at the unit prices shown on the attached schedule; that, at the time of opening bids, totals only will be read, but that comparison of bids will be based on the correct summation of item totals obtained from the unit prices bid, as provided in Mn/DOT 1301.

(I)(We) propose to furnish all necessary machinery, equipment, tools, labor and other means of construction and to furnish all materials specified, in the manner and at the time prescribed, all according to the terms of the Contract and Plans, Specifications, and the Special Provisions forming a part of this.

(I)(We) further propose to do all Extra Work that may be required to complete the contemplated improvement, at unit prices or lump sums to be agreed upon in writing before starting such work, or if such prices or sums cannot be agreed upon, to do such work on a Force Account basis, as provided in Mn/DOT 1904.

(I)(We) further propose to execute the form of Contract within 10 days after receiving written notice of award, as provided in Mn/DOT 1306.

(I)(We) further propose to furnish a payment bond equal to the Contract amount, and a performance bond equal to the Contract amount, with the aggregate liability of the bond(s) equal to twice the full amount of the Contract if the contract is less than or equal to five million dollars (\$5,000,000.00), or if the contract is in excess of five million dollars (\$5,000,000.00) the aggregate liability shall be equal to the amount of the contract, as security for the construction and completion of the improvement according to the Plans, Specifications and Special Provisions as provided in Mn/DOT 1305.

(I)(We) further propose to do all work according to the Plans, Specifications and Special Provisions, and to renew or repair any work that may be rejected due to defective materials or workmanship, before completion and acceptance of the Project by Blue Earth County.

(I)(We) agree to all provisions of Minnesota Statutes, Section 181.59.

(I)(We) further propose to begin work and to prosecute and complete the same according to the time schedule set forth in the Special Provisions for the improvement.

(I)(We) assign to Blue Earth County all claims for overcharges as to goods and materials purchased in connection with this Project resulting from antitrust violations that arise under the antitrust laws of the United States and the antitrust laws of the State of Minnesota. This clause also applies to subcontractors and first tier suppliers under this Contract.

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

NOTICE TO BIDDERS

Minnesota Statutes that require prompt payment to subcontractors:

471.425 Prompt payment of local government bills.

Subd. 1. Definitions. For the purposes of this section, the following terms have the meanings here given them.

(d) "Municipality" means any home rule charter or statutory city, county, town, school district, political subdivision or agency of local government. "Municipality" means the metropolitan council or any board or agency created under chapter 473.

Subd. 4a. Prompt payment to subcontractors.

Each contract of a municipality must require the prime contractor to pay any subcontractor within ten days of the prime contractor's receipt of payment from the municipality for undisputed services provided by the subcontractor. The contract must require the prime contractor to pay interest of 1-1/2 percent per month or any part of a month to the subcontractor on any undisputed amount not paid on time to the subcontractor. The minimum monthly interest penalty payment for an unpaid balance of \$100 or more is \$10. For an unpaid balance of less than \$100, the prime contractor shall pay the actual penalty due to the subcontractor. A subcontractor who prevails in a civil action to collect interest penalties from a prime contractor must be awarded its costs and disbursements, including attorney's fees, incurred in bringing the action.

HIST: 1985 c 136 s 5; 1995 c 31 s 1

SPECIAL PROVISIONS
DIVISION A
SPECIAL REQUIREMENTS

INTENT OF CONTRACT

This Contract consists of the following:

C.P. 102 -- Red Jacket Bridge #6961, South Pier Replacement & Erosion Protection

Each project be considered individually on the schedule of prices in the proposal but only the grand total of all the roads combined will be considered in awarding the contract. Bids not including all projects will not be accepted.

GOVERNING SPECIFICATIONS

The State of Minnesota, Department of Transportation "Standard Specifications for Construction" 2005 EDITION shall apply in this contract, except as modified or altered in the following Special Provisions.

SPECIAL PROVISIONS
DIVISION S
SPECIAL REQUIREMENTS

PERMITS

Blue Earth County has received approval from all required agencies for this project on an "Emergency" basis. Documentation of this approval is on file at the Engineers Office.

(1208) PROPOSAL GUARANTY

No proposal will be considered unless it is accompanied by a guaranty complying with the requirements of Specification 1208 and providing a penal sum at least equal to 5 percent of the total amount of the bid (under all circumstances and without exception) as provided in Specification 1208.

(1302) AWARD OF CONTRACT

The provisions of MNDOT 1302 are modified as follows:

The first sentence is revised to read: "The award of Contract, if it be awarded, will be made within 60 Calendar Days after the opening of the Proposals to the lowest responsible bidder who complies with all prescribed requirements."

(1305) REQUIREMENT OF CONTRACT BOND

The provisions of Mn/DOT 1305 are hereby deleted and replaced with the following:

The successful bidder shall furnish a payment bond equal to the contract amount and a performance bond equal to the contract amount as required by Minnesota Statutes, section 574.26. The surety and form of the bonds shall be subject to the approval of the contracting authority.

The contracting authority shall require for all contracts less than or equal to five million dollars (\$5,000,000.00), that the aggregate liability of the payment and performance bonds shall be twice the amount of the contract. All contracts in excess of five million dollars (\$5,000,000.00) shall have an

aggregate liability equal to the amount of the contract.

(1404) MAINTENANCE OF TRAFFIC, (1707) PUBLIC SAFETY, AND (2563) TRAFFIC CONTROL - MODIFIED

The Contractor shall provide two (2) extra Type 1 Barricades on site.

The Contractors Vehicles shall be equipped with an operational Vehicle Warning Light in accordance with the following specs:

<u>360 Degree Rotating Lights</u>	<u>-</u>	<u>SAE Spec. J845</u>
<u>Flashing Lights</u>	<u>-</u>	<u>SAE Spec. J585</u>
<u>Flashing Strobe Lights</u>	<u>-</u>	<u>SAE Spec. J1318</u>

(1701) LAWS TO BE OBSERVED (DATA PRACTICES)

The provisions of Mn/DOT 1701 are supplemented with the following:

Bidders are advised that all data created, collected, received, maintained, or disseminated by the Contractor and any subcontractors in performing the work contained in this Contract are subject to the requirements of MN Statute Chapter 13, the Minnesota Government Data Practices Act (MGDPA). The Contractor shall comply with the requirements of the MGDPA in the same manner as the Department. The Contractor does not have a duty to provide access to public data to the public if the public data are available from the Department, except as required by the terms of the Contract.

(1803) CRITICAL PATH METHOD (CPM) SCHEDULE - MODIFIED

The provisions of 1803 are modified to the extent that the "Progress Schedule" (bar chart or critical path diagram) referenced in 1803.1 and elsewhere will not be required on this Project. This shall, however, in no way lessen the Contractor's responsibility for (1) providing the Engineer with the notifications required by the provisions of 1803.2; and (2) prosecuting the work diligently, as required therein, so as to assure satisfactory progress towards a timely completion of the Project. No work shall be performed during the hours of darkness as determined by the Engineer.

(1806) DETERMINATION AND EXTENSION OF CONTRACT TIME

The Contract Time will be determined in accordance with the provisions of Mn/DOT 1806 and the following:

Construction operations shall be started on or before July 25, 2010 or within eight (8) Calendar Days after the date of Notice of Contract Approval, whichever is later. Construction operations shall not commence prior to Contract Approval.

All work required under this Contract, except maintenance work and Final Clean Up shall be completed **within 55 Working Days.**

When, in the opinion of the Engineer, work on the Project cannot be performed due to failure of material delivery beyond the control of the Contractor, the Engineer will agree to a Suspension of Work in conformance with Mn/DOT 1803.4 and/or will cease the charging of working days, whichever the Engineer deems applicable.

A Resumption of Work Order will be issued by the Engineer after the Contractor has received delivery of the required material, and/or the Engineer will resume the charging of working days.

(1807) FAILURE TO COMPLETE THE WORK ON TIME

Liquidated damages will be assessed in accordance with the provisions of Mn/DOT 1807.

(1906) PARTIAL PAYMENTS - MODIFIED

Partial payments shall be made in accordance with the requirements of 1906, except as modified below:

The first line of the third paragraph is modified to read: From the amounts ascertained as payable on each partial estimate, five (5) percent will be retained until final payment is made, unless reduced by authorization of the Engineer, on the last partial payment.

(1910) FUEL COST ADJUSTMENT - MODIFIED

The provisions of 1910 are hereby deleted. There will be no fuel cost adjustment for fuel escalation.

(2051) MAINTENANCE & RESTORATION OF HAUL ROADS - MODIFIED

Maintenance and restoration of haul roads shall be done in accordance with the provisions of 2051 except as modified below:

Prior to hauling of any materials on this project, Contractor shall submit a list of proposed haul roads to the Engineer for his approval. The Contractor shall also submit a list of all township roads that are proposed to be used as haul roads to the township official for their approval.

Contractor will be required to maintain and restore haul roads as per Specification No. 2051.4 Any costs that the Contractor may incur during this operation will be considered incidental and no direct compensation will be made therefore.

Mn/DOT Bridge. No. 6961 – Red Jacket Trail Bridge Over LeSuer River and TH 66

DIVISION SB

BRIDGE PLANS

The plans for this Project, consisting of the sheets tabulated below, were approved by the State Bridge Engineer.

<u>BRIDGE NO.</u>	<u>TOTAL SHEETS</u>	<u>SHEET NO.</u>	<u>DATE OF APPROVAL</u>
6961	17	1 to 17	

New or revised sheets were approved as listed below:

<u>BRIDGE NO.</u>	<u>SHEET NO.</u>	<u>DATE OF APPROVAL</u>
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I hereby certify that the Special Provisions for bridge construction (Division SB) contained in this Proposal were prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.


(Gaylen L. Perkuhn)

Date: 03/16/2011 Lic. No. 15925

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DIVISION SB

SB-1 SCOPE OF WORK

The work under the bridge portion of the Contract consists of construction of a new south pier, installation of a salvaged/relocated steel deck girder span, reconstruction of a timber trestle span, reconstruction of timber decking and timber railings, placement of riprap, and repair work for the existing north pier as required to place Mn/DOT Bridge No. 6961 (Red Jacket Trail Bridge) back into service. This bridge was partially removed and salvaged in order to stabilize the existing bridge and to re-establish public use of TH 66 after the south river pier was severely damaged by September 2010 flooding of the LeSuer River. The Red Jacket Trail Bridge over the LeSuer River and portions of the Red Jacket Trail adjacent to the bridge are presently closed to protect the public.

SB-1.1 General Description of New South Pier Construction and Partial Bridge Reinstallation Work

The new south pier and partial bridge reinstallation work required to place the Red Jacket Bridge back into service are summarized below:

1. Prepare temporary access road(s) and/or furnish temporary access from the river to the site as required to conduct the new south pier construction, the partial bridge reinstallation, and the existing pier repair work required.
2. Maintain all existing barricades and traffic control installed in the previous Project in order to ensure security of the construction site.
3. Perform construction survey as required to set vertical and horizontal control required for the construction work.
4. Prepare slopes as required to permit south pier construction. Install permanent sheet piling. Construct new south pier. If the sheet piling was used as a cofferdam, trim the tops of the permanent sheet piling at the top of south pier footing elevation.
5. Conduct the repair work required for the existing center pier.
6. Prepare the previously salvaged steel deck girder span and the adjacent timber trestle approach span for the required reinstallation work.
7. Reinstall the previously salvaged steel deck girder span. Reconstruct the adjacent timber trestle span. Reconstruct the previously salvaged timber decking and timber railings.
8. Place new riprap at the south pier locations. Install salvaged stone as required.
9. Remove the temporary access road(s) and/or any temporary access from the river to original existing conditions. Restore disturbed areas resulting from the previous partial bridge span relocation and damaged south pier removal project work. Install turf establishment as required to restore the disturbed areas.
10. Dispose of all debris still remaining from the partial bridge removal and salvage project work. Dispose of all debris generated during the new south pier construction, the partial bridge reinstallation, the existing pier repair work, and riprap placement work at locations approved by the Engineer.

SB-1.2 Construction Requirements and Considerations

The Contractor shall exercise care at all time to ensure safety during the Project, especially during the partial bridge steel deck girder reinstallation to prevent damage to the existing bridge span.

SB-1.3 Bridge Plans and Special Provisions

The dimensions and elevations of the existing structure as shown in the Plans shall be considered approximate. The Contractor shall take sufficient measurements of the existing structure as required to conduct partial bridge relocation and reinstallation work.

No existing plans for the original railroad bridge are available. The Plans and Special Provisions were developed from previous bridge reconstruction plans prepared for the bridge conversion to a pedestrian trail bridge along with recent Mn/DOT survey 3D scanning measurements.

The Contractor is advised the Plans and Special provisions are not integrated to show all aspects of the previous partial bridge removal, salvage, and relocation work required to stabilize the bridge. The Contractor shall be responsible to complete all work required to properly and safely stabilize the existing bridge structure and to re-establish public use of the Red Jacket Trail Bridge.

SB-2 (1508) CONSTRUCTION STAKES, LINES, AND GRADES

The provisions of Mn/DOT 1508 are hereby supplemented and modified as follows:

The following is added to the first paragraph of Mn/DOT 1508:

The Engineer will set no construction stakes.

The Contractor shall use the bench mark at the SW corner of the TH 66 Bridge Over the LeSueur River (Mn/DOT Bridge No. 07002). The Contractor will be responsible for establishing required grade points from bench mark. The Contractor will be responsible for establishing the horizontal control for the Project and set the baseline centerline of the bridge alignment. The Contractor shall assume full responsibility for all measurements made by him/her from the stakes and marks so established.

SB-3 (1701) LAWS TO BE OBSERVED (BRIDGE)

The provisions of Mn/DOT 1701 are modified and/or supplemented with the following:

SB-3.1 The Contractor shall use Mn/DOT approved companies for testing, waste transport and disposal as provided and described in Mn/DOT's manual "Asbestos and Regulated Waste Manual For Structure Demolition Or Relocations for Construction Projects" available on the following website:
<http://www.dot.state.mn.us/environment/regulated-materials/index.html>. Contact Mark Vogel, Office of Environmental Services, 651.366.3630 with any questions regarding the manual.

The Contractor shall only use Mn/DOT approved contractors for: building/bridge assessments, asbestos abatement and regulated waste oversight, asbestos removal, regulated waste removal, and regulated waste disposal and recycling (for a list of Mn/DOT Approved Contractors call 651.366.3630).

The Contractor shall use only MPCA permitted Combined Solid Waste Disposal Facilities to dispose of all solid waste including demolition debris. Demolition debris shall not be disposed of in a permit-by-rule landfill.

SB-3.2 The successful bidding Contractor shall:

- (A) Comply with the Environmental Protection Agency (EPA) Regulations, 40 CFR pt. 61, subd.M - NATIONAL EMISSION STANDARD FOR ASBESTOS.
- (B) Provide the Minnesota Pollution Control Agency (MPCA) and The Mn/DOT Project Engineer written notice of intention to demolish or move a structure - see form "Notification of Intent to Perform a Bridge Demolition for Mn/DOT Operations" at

http://www.dot.state.mn.us/environment/reg_mat/bldg_demo.html. Such notice shall be provided to the MPCA and the Mn/DOT Project Engineer a minimum of 10 working days before any move or demolition.

- (C) And if the bridge contains any asbestos, the Contractor shall:
- (1) Use a Minnesota Department of Health (MDH) certified oversight contractor to oversee the MDH certified asbestos abatement contractor.
 - (2) Depending on the amounts and types of asbestos on the premises Submit "Notification of Asbestos Related Work", to the Minnesota Pollution Control Agency and the Mn. Department of Health 10 working days prior to commencement of abatement activities. The Contractor shall submit a copy of the completed notification/s to The Mn/DOT Project Engineer at the same time.
 - (3) Submit all required documentation to the Minnesota Pollution Control Agency and the Mn Department of Health to the respective regulatory agencies and copy the Mn/DOT Project Engineer on all submittals. Information on the requirements of MPCA can be found at: http://www.pca.state.mn.us/programs/asbestos_p.html. Information on the requirements of the Department of Health can be found at: <http://www.health.state.mn.us/divs/eh/asbestos/index.html>.
 - (4) Transport all asbestos containing waste in compliance with USDOT packaging and transportation requirements. The Contractor shall provide The Mn/DOT Project Engineer with all Asbestos Containing Material Transportation shipping papers/manifests. A Shipping paper can be obtained in part 61.145 on the following website: <http://www.epa.gov/opptintr/asbestos/pubs/2003pt61.pdf>
 - (5) Dispose of all asbestos containing waste in a Minnesota Pollution Control Agency permitted mixed municipal solid waste or Industrial landfill (not demolition debris landfills) permitted to accept asbestos containing wastes. Provide The Mn/DOT Project Engineer all landfill disposal receipts.
- (D) Comply with Mn/DOT's manual "Asbestos and Regulated Waste Manual For Structure Demolition Or Relocations for Construction Projects" available on the following website: <http://www.dot.state.mn.us/environment/regulated-materials/index.html>.

SB-3.3 The successful Contractor shall comply with all Mn/DOT policy, laws, regulations and/or rules regarding the removal and recycling/disposal of any regulated wastes including, but not limited to: see manual for procedures and approved contractors/end sites.

1. Treated Wood
2. Lead Paint
3. Lead Plates
4. Polychlorinatedbiphenols (PCB's)
5. Mercury

The transportation of all the above wastes shall be in compliance with USDOT packaging and transportation requirements. The Contractor shall provide The Mn/DOT Project Engineer with all shipping papers or manifests.

The Contractor shall provide the Mn/DOT Project Engineer with copies of disposal or recycling records.

SB-3.4 FAILURE TO COMPLY WITH NOTIFICATION PROVISIONS WILL BE DEEMED A MATERIAL BREECH OF CONTRACT. IN THE EVENT THAT A REGULATORY AGENCY IMPOSES MONETARY SANCTIONS ON Mn/DOT THAT ARE BASED, IN WHOLE OR IN PART, UPON THE ACTS

OR OMISSIONS OF THE CONTRACTOR, THE CONTRACTOR AGREES TO INDEMNIFY Mn/DOT AND TO HOLD Mn/DOT HARMLESS FOR SAME, EXCEPT TO THE EXTENT THAT ANY SANCTIONS WERE CAUSED BY Mn/DOT'S OWN NEGLIGENCE.

SB-4 (1706) EMPLOYEE HEALTH AND WELFARE

The provisions of Mn/DOT 1706 are supplemented as follows:

The Contractor shall submit a plan, at the preconstruction conference, for providing all OSHA required safety equipment (safety nets, static lines, false decks, etc.) for all work areas whose working surface is 1.8 meters (6 feet) or more above the ground, water, or other surfaces. Submittal of this plan will in no way relieve the Contractor of his/her responsibility for providing a safe working area.

All safety equipment, in accordance with the Contractor's plan, must be in place and operable in adequate time to allow Mn/DOT personnel to perform their required inspection duties at the appropriate time.

The installation of safety lines, safety nets, or other systems whose purpose is to reduce the hazards of bridge work may require the attachment of anchorage devices to beams, girders, diaphragms, bracing or other components of the structure. Clamp type anchorage systems which do not require modification of structural members may be used provided they do not interfere with proper execution of the work; however, if the Contractor desires to use an anchorage system which requires modification of structural members, s/he shall request approval, in writing, for plan modification as provided in Mn/DOT Specifications. Requests to install systems which require field welding or drilling of primary stress carrying members of a bridge will not be approved. The Contractor shall indicate any portions of anchorage devices which will remain permanently in the structure.

On both ends of each pier cap extending 1.8 meters (6 feet) or more above the ground, the Contractor shall install an insert or other suitable anchorage to which safety lines can be attached. Any portion of said device extending outside the finished lines of the pier cap shall be removed unless otherwise approved by the Engineer. Any void or cavity resulting from the installation or removal of this device shall be repaired or sealed to prevent the ponding or entry of water as directed by the Engineer.

Approved anchorage systems shall be furnished, installed, and removed at no increased cost to the State for materials, fabrication, erection, or removal of the bridge component or anchorage system.

The Contractor is hereby notified that paint systems on Bridge No. 6961 may contain lead. Precautions to protect worker health and safety may be necessary if operations by the Contractor result in removal or detachment of paint from metal surfaces.

SB-5 (1717) AIR, LAND AND WATER POLLUTION

The provisions of 1717 are supplemented as follows:

The Contractor's attention is hereby directed to MPCA Rule 7011.0150 as it relates to sandblasting and/or concrete removal operations (<http://www.pca.state.mn.us/index.cfm>).

Unless otherwise provided in these special provisions, construction, demolition and/or removal operations conducted over or in the vicinity of public waters shall be so controlled as to prevent materials from falling into the water. Any materials which do fall into the water, or onto areas where there is a likelihood that they will be picked up by rising water levels, shall be retrieved and stored in areas where such likelihood does not exist.

SB-6 (1807) FAILURE TO COMPLETE WORK ON TIME

The provisions of Mn/DOT 1807.1 are supplemented as follows:

The Contractor's attention is hereby called to the requirements for, *Containment and Disposal of Waste Materials*, as indicated in these special provisions.

The Contractor will be subject to a daily charge for failure to submit documentation of the testing and disposal of hazardous and non-hazardous waste as required under these special provisions. A \$100.00 monetary deduction per calendar day, per shipment will be assessed and the amount deducted from any monies due the Contractor, until all work is complete to the satisfaction of the engineer.

The monetary deduction as set forth above may apply equally, separately and may be assessed concurrently with other damages as described in these special provisions and the Standard Specifications for Construction.

SB-7 (2011) CONSTRUCTION SURVEYING

The provisions of Mn/DOT 1508 are hereby modified and supplemented as follows:

SB-7.1 General Survey Specifications

This Contract provides for the Contractor to accomplish the Construction Surveying for this Project. Mn/DOT 1508 is herewith modified to the extent that the Contractor shall meet all the requirements of, and provide all the services listed in, Mn/DOT 1508 which would otherwise be provided by Mn/DOT. Furthermore, in accordance with Mn/DOT 1401, the Contractor is advised that the Contract may not fully describe every detail or make specific allowances for all probable exceptions and contingencies related to the Construction Surveying requirements for this Project. Additional best management practices (BMP's) for Construction Surveying are identified in Appendix A of the Mn/DOT Surveying and Mapping Manual, in addition to the requirements shown below:

SB-7.2 Surveying To Be Performed By The Engineer/Owner

- (A) The benchmark shown on the Plans is the vertical control points in the field for the Project as indicated in the Plans

At the discretion of the Engineer, spot checks may be performed upon the Contractor's surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in a manner that will assure proper controls and accuracy, the Engineer will order the Contractor to redo such work, to the standards specified in the Contract, at no additional cost to the Owner.

If the Owner sustains undue costs in checking excessive amounts of Contractor Construction Surveying, or must perform survey work that is the Contractor's responsibility, the Engineer may deduct the Owner's cost from monies due or becoming due the Contractor in accordance with the following rates:

	Hourly Rates
Registered Engineer or Licensed Land Surveyor	\$80.00
4-person crew and equipment	\$240.00
3-person crew and equipment	\$180.00
2-person crew and equipment	\$125.00
1-person with equipment	\$75.00

or as incurred by the Owner should it become necessary, due to the Owner's resource commitments, to have such work performed by a consultant under contract to the Owner.

- (B) The Engineer will not measure any of the pay quantities;

The Contractor shall be responsible to measure required pay quantities and submit documentation to the Engineer for Approval.

- (C) The Contractor will be responsible for setting the following final monumentation:

Horizontal Control
Vertical Control
Alignment
Profile

SB-7.3 Construction Surveying By The Contractor

- (A) Contractor Construction Surveying Requirements

Construction Surveying is defined as accurately providing all necessary computations, stakes and marks to establish lines, slopes, elevations, points, continuous profile grades in accordance with Mn/DOT 1508 and the requirements shown in the Plan for Construction Staking; so that the Contractor's forces are able to construct all required work for the Project in accordance with the Contract requirements; and so that the Owner's Engineers and Inspectors are able to complete all necessary inspection and Contract Administration duties. The staking shall include, but not be limited to, clearing and grubbing, removals, structure excavations and backfills, riprap grading and slope preparation, bridges, utilities, signs, erosion control and turf establishment items to complete the Project as represented in the Plans. The Surveying must be done in a way that is timely, and that is reflective of the continuing and ongoing nature of construction and inspection activities which will generally require frequent, separate Project visits by the Contractor's survey crew to the Project to accommodate the various stages of construction and inspection activities that will occur.

The Surveyor shall be prepared to make all necessary surveying checks for field verification of actual conditions and shall make the necessary minor surveying and staking adjustments to fit the construction to actual field conditions. In addition, some Plan details may be dependent upon actual field conditions at the time of construction. It may be necessary to perform some field survey or office computations in order to stake these components. All work referred to in this paragraph is considered part of the work of Construction Surveying and no additional payment will be made for this work.

The Contractor shall retain a Professional Land Surveyor or Professional Engineer, licensed in the State of Minnesota, to directly supervise the Construction Surveying. Any determination of, or marking of, Right-of-Way must be performed under the supervision of a Licensed Land Surveyor. Additionally, for those projects let after August 31, 2007, an individual holding a NSPS - ACSM Level III certification in Construction Surveying, an LSIT, or a licensed Surveyor/Engineer, shall be on the Project site at all times to directly supervise the survey crew(s).

The Contractor shall:

1. Be responsible for the preservation of all reference points, monuments, government land corners, horizontal and vertical control points, stakes, and marks that are established by the Owner or others within the Project limits. If the Contractor or its surveyor fails to preserve these items and if they must be reestablished by the Owner, the Engineer will deduct a charge from monies due or becoming due the Contractor according to the Department's costs as shown elsewhere in these Special Provisions.
2. Be responsible to review, balance, adjust, correct, and investigate the Plan provided data and to perform work on survey data and control points that may be necessary to use the survey points and data, all at no extra cost to the Owner.
3. Start and end all level runs, traverses, or GPS control surveys, from known control. Complete all control surveys at no worse than the standards specified for supplemental control in Chapter 2, Mn/DOT Surveying and Mapping Manual.

4. Unless otherwise agreed to, set all stakes and marks in accordance with the Staking Information Sheets included in the Plan.
5. Furnish and install traffic control devices in accordance with the Field Manual for Temporary Traffic Control Zone Layouts, Part VI, (MN MUTCD), when crew members are exposed to traffic.
6. Perform all Construction Surveying for all Project construction as shown in Mn/DOT 1508, and shall install reference points as needed for the use of any public utility crews that are staking or accomplishing utility relocation or construction associated with this Contract.
 - a. From Vertical Control Points (bench marks) referenced by the Engineer.
 - b. According to the Plan, Proposal and Standard Specifications.
 - c. According to the Mn/DOT Surveying and Mapping manual.
 - d. According to actual existing field conditions.
7. Perform Bridge and Structure Construction staking which includes setting and reestablishing Working Points and Reference Points by XYZ coordinates to provide line and grade during all stages of work, and at all substructures and segments of Bridge or Structure Construction, as shown below:
 - a. Establish Working Points or Reference Points, approved by the Engineer, on the ground as shown on the Bridge Layout sheet in the Plans.
 - b. Transfer of required points from the ground to the top of footing after completion of concrete footing construction. If the structure is a curved wall or bridge edge of slab, curb, coping, median, or railing, the Contractor's Surveyor shall mark a curved line on the footings, forms, or deck slab, to the proper degree of curvature within 3 mm in 3 meters, 1:1000 (**1/8 inch in 10 feet**), as needed for construction and inspection activities.
 - c. Transfer required points to the top of all finished structures.
 - d. Transfer required points to the superstructure deck.
 - e. Field measure and survey of existing steel deck girder span to confirm bridge dimensions (including distance from top of timber deck to bottom of sole plate at south pier end of steel deck girder span).
 - f. Field measure and survey of existing upper concrete shafts for the center and north piers to confirm existing pier dimensions at the proposed steel band elevations.
 - g. Field measure and survey of existing lower stone shaft for the center pier to confirm existing pier dimensions and elevations at the proposed nose armor plate location.
 - h. Reestablish the vertical profile of the existing bridge at top of timber deck. Confirm top of new and existing pier bearing seat elevations.
 - i. Confirm/set centerline/s of new south pier based on existing salvaged steel deck girder span geometrics and the adjacent existing timber trestle span to permit new concrete pier and new permanent steel sheet piling construction.
 - j. Confirm elevations of the top bearing shelf of the new south pier. Confirm height of salvaged timber trestle end bent to bear on new south pier top bearing shelf.
8. Bear all costs, including but not limited to the cost of actual reconstruction of Contract work, that may be incurred due to errors in Contractor's Construction Surveying.
9. Document surveying during construction in a form acceptable to the Engineer and allow the Engineer access to surveying notes and calculations. The survey documentation includes:
 - a. Control station monumentation with reference ties.

- b. Field notes that were used to set construction stakes, control the Project, and document monument locations. The Contractor shall use bound, hard cover field books for recording survey data and field notes; store field notes on an electronic medium; or use both methods. If an electronic medium is used, the raw field data files must be available. When using an electronic medium, the Contractor shall make all files and data available in the Standard formats used by the Department.
 - 10. Present the Engineer with the as-built Survey Data. The as-built Survey Data shall include the following:
 - a. Control established by the Contractor
 - i. Alignment
 - ii. Profile
 - iii. Horizontal Control
 - iv. Vertical Control
 - b. Locations of utilities relocated or emplaced as part of the Project
 - c. Identify any alignment, Right-of-Way, property, or control monumentation destroyed during the Project
 - d. Any alignment, Right-of-Way, property, or control monumentation that was placed during the Project and that still exists at Project completion.
 - e. The information shall include the x, y and, if applicable, the z coordinates in the Project datum. If the original item had no coordinate reference, then show the revised centerline station and offset.
 - f. The information shall be provided in both electronic (Microstation and GeoPak) and hard copy format.
 - g. In the case of new monumentation, there should also be a report describing how the monumentation was placed. This will include copies of any fieldwork (traverse or leveling) as well as any adjustments used. It shall also include tie sheets, to include a description of the physical object placed as the monument.
 - 11. Furnish survey documentation and as-built Survey Data to the Engineer within the time limits indicated in the surveying work schedule.
- (B) Contractor Construction Surveying Activities
- 1. At the preconstruction conference, the Contractor shall submit to the Engineer for approval a written Construction Surveying Work Plan and Schedule detailing:
 - a. Pertinent information as to how the requirements in these specifications, and the requirements in Appendix A of the Mn/DOT Surveying and Mapping Manual, are being met by the Contractor's Surveyor.
 - b. A Project specific Construction Surveying Work Schedule for the Construction Surveying and how it relates to the time frame for construction activities and Owner/Engineer inspection needs.
 - c. A proposed method of communications between the Contractor and the Engineer.
 - d. How and when the Contractor's Surveyor will make delivery of the as-built Survey Data to the Engineer.
 - 2. During the course of construction, the Contractor shall give notice of commencement of any Construction Surveying activities according to Mn/DOT 1803.2.

SB-7.4 Method of Measurement

The Engineer will measure Construction Surveying on a lump sum basis.

SB-7.5 Basis of Payment

Construction Surveying will be on a Lump Sum Basis at the Contract unit bid price. Payment shall be compensation in full for all surveying work including materials, surveying equipment, labor, office work, and any incidental costs required by the Contract.

(A) Payment Schedule

Mn/DOT will authorize partial payment for 10 percent of the Contract unit bid price for Construction Surveying after completion of the first day of Contractor Surveying in the field. When Construction Surveying is more than 10 percent complete, the Engineer will authorize partial payment in the same percentage as the percentage of Construction Surveying accomplished, as determined by the Engineer, up to 90 percent of the lump sum bid price. The Contractor will receive the final 10 percent of the lump sum bid price when the survey computations, notes, miscellaneous documents, and as-built Survey Data as specified have been received and accepted by the Engineer within the time limits specified by the Survey Work Schedule. If the Contractor fails to provide acceptable documentation and the as-built Survey Data within the time limits specified, the Engineer reserves the right to reduce the lump sum payment for Contractor Construction Surveying by a percentage of up to 10 percent of the lump sum bid price.

(B) Payment for Extra Work

When the Engineer determines that extra or additional Construction Surveying beyond the scope of the original Contract is required and orders the Contractor to accomplish this work, compensation will be made as Extra Work in accordance with Mn/DOT 1904 and at the same rate shown for an Owner's survey crew above. If the Construction Surveying is accomplished by a subcontract, the prime Contractor allowance will be five (5) percent.

(C) Payment

Payment for Construction Surveying will be made on the basis of the following:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2011.601	Construction Staking	Lump Sum

SB-8 (2104) REMOVAL OF ASBESTOS AND REGULATED WASTE (BRIDGE)

This work shall consist of the removal and disposal of any loose material or debris containing regulated waste resulting from partial removal of the existing bridge in accordance with the applicable Mn/DOT Standard Specifications and the following:

SB-8.1 If during the course of removal of portions of the bridge, any loose material or debris (generated from removal operations) containing asbestos materials or regulated wastes are encountered, the Contractor shall notify the Mn/DOT Project Engineer for direction. The debris containing asbestos or regulated waste shall be isolated and contained as required.

SB-8.2 All asbestos and/or regulated waste debris generated by partial bridge removal operations shall be disposed of in accordance with Mn/DOT's manual. Only those listed in this manual as pre-approved for asbestos and/or regulated waste will be allowed to work on this Project. The Contractor's shall use Mn/DOT approved companies for testing, waste transport and disposal as provided and described in Mn/DOT's manual "*Asbestos and Regulated Waste Manual For Structure Demolition Or Relocations for Construction Projects*" available on the following website: <http://www.dot.state.mn.us/environment/regulated-materials/index.html>. Contact Mark Vogel, Mn/DOT Office of Environmental Services, 651.366.3630 with any questions regarding the manual.

SB-8.3 All material shall be removed, identified, and disposed of in accordance with Section SB 1701 (LAWS TO BE OBSERVED (BRIDGE)) of these Special Provisions. The Contractor will not receive permission to begin the regulated waste removals, with the exception of material needed for hazardous and regulated waste assessment or testing, until the Engineer has copies of all required notices.

SB-8.4 The Contractor will not be allowed to proceed with disposal of the regulated waste until the Engineer has received copies of all required notifications as indicated in Section SB-1701 (LAWS TO BE OBSERVED (BRIDGE)) of these Special Provisions.

SB-8.5 No measurement will be made of any portion of the asbestos or regulated waste material removal, but the complete removal thereof as specified shall be construed to be included in the single lump sum for which payment is made under Item 2104.601 "Remove Regulated Waste (Bridge)".

SB-9 (2401) CONCRETE BRIDGE CONSTRUCTION

The provisions of Mn/DOT 2401 are modified and/or supplemented with the following:

Delete the first sentence of the first paragraph of 2401.3G:

Cure newly placed concrete by providing protection against rapid loss of moisture, freezing temperatures, high temperatures, abrupt temperature changes, vibration exceeding a normal or reasonable limit as described in the Bridge Construction Manual chapter .362, shock waves, and prematurely applied loads.

Add the following to the end of the second paragraph of 2401.3G:

All sections not included in superstructures.....45

SB-9.1 Concrete Aggregate for Bridges

The provisions of 2401.2A shall apply except as modified herein:

Delete the second paragraph of 2401.2A and substitute the following therefor:

Class A Coarse Aggregate, as defined in 3137.2B, shall be used in all concrete for bridge superstructures, except that coarse aggregate requirements for precast concrete members fabricated under 2405 shall be as specified in 2461.2D.

SB-9.2 Joint Filler and Sealing

The provisions of 2401.3J1 are supplemented as follows:

Prior to installation of sealing materials, concrete curing shall be completed. A minimum of 7 days drying is required prior to application of sealers. Sawcut joints shall be sandblasted, blown clean, and the concrete surfaces shall be dry at the time sealer is installed.

Preformed joint shall be as detailed in the Plans and in conformance with the following requirements.

1. Bituminous felt shall comply with AASHTO M33, modified to the extent that the load required to compress the test specimen to 50 percent of its thickness before test shall be not more than 8274 kPa (1200 psi).
2. Cork shall comply with Mn/DOT 3702 and AASHTO M153 Type II.
3. Polystyrene shall comply with the following:

Type	Minimum Compressive Strength (5 percent deflection)	Characteristics
A	207 kPa (30 psi)	Closed Cell Expanded Polystyrene
B	69 kPa (10 psi)	Molded Polystyrene

Testing for compressive strength of polystyrene shall be in accordance with ASTM D 1621. The Contractor shall, if requested by the Engineer, furnish evidence that the material meets these requirements.

The quantity of preformed cork joint filler material given in the Plans is for the Contractor's convenience only. Any additional joint filler required shall be furnished by the Contractor with no additional compensation.

SB-9.3 Architectural Concrete Texture (Rock Face)

This work consists of constructing textured surfaces on specified areas of the new south replacement pier included in the Project as shown in the Plans. The work shall be performed in accordance with the applicable provisions of Mn/DOT 2401, the Plans and the following:

A. Definition of Architectural Concrete Texture (Rock Face)

Architectural Concrete Texture (Rock Face) shall have a texture created from weathered limestone with a maximum relief of 2 ½ inch. The standard manufactured pattern shall be selected that is similar to the stone blocks of the existing north and center piers. The typical stone block sizes are approximately 6 feet long by 2 feet high in a random bond pattern. The minimum length of the stone blocks at the corners of the shaft shall be 1 foot long. The Contractor shall field measure the existing stone block sizes used for the existing piers to aid in the selection of similarly proportioned formliner. Submit the field measurements to the Engineer for information. Refer to the photos below on the next two pages showing the stone block pattern used for the existing piers:

B. Formed Textured Surfaces

The textured concrete surfaces shall be formed using a form lining system made of high-strength urethane elastomer capable of withstanding anticipated concrete pour pressures without leakage or causing physical defects. Form liners shall attach easily to forms and be removable without causing concrete surface damage. The liners shall be designed to form surfaces conforming to the design intent including the shape, lines and dimensions described herein and in the Plans.

If applicable, match pattern features at form liner joints to minimize visible pattern repeats and make the formed concrete surface appear uniform and continuous without visible seams and form marks. When joints are unavoidable, make joints along main features of the pattern.

Subject to compliance with requirements, provide form liner materials from the following manufacturers:

1. Custom Rock International, Inc.
2. Milestones, Inc.
3. ThemeScapes, Inc.

4. Other approved manufacturers

Form ties shall be made of non-corrosive materials when the portion permanently embedded in the concrete is less than 1½ inches from the finished surface.

Form release agents shall be fully compatible with the form liner material and the special surface finish to be applied to the textured surfaces.

C. Submittals

Within 60 calendar days of execution and approval of the Contract, the Contractor shall submit the following to the Engineer for approval:

1. Product data including manufacturer's technical information and use instructions for formliner placement and release.
2. Actual samples of form liner material (minimum of 1 foot x 1 foot).
3. Actual samples of form ties that will be permanently embedded in the concrete.
4. Qualification data for firms and persons specified below under Quality Assurance to demonstrate their capabilities and experience. Include a list of completed projects with project names, addresses, names of architects, engineers and owners, and any other pertinent information.
5. Shop drawings indicating form liner layout and termination details. Indicate backup, rustication, reveal, and chamfer strip locations. Include jointing, form tie location, pattern placement, and end, edge and other special conditions. Indicate tolerances and procedure of installation and separation.
6. Field measurements of existing stone sizes and layout.

Architectural Concrete Texture – Random running bond pattern at adjacent piers



Architectural Concrete Texture – Random running bond pattern at adjacent piers



D. Quality Assurance

1. Manufacturer's Qualifications: The form liner manufacturer must have five years minimum experience making liners used to create formed concrete surfaces matching natural stone shapes and textures.
2. Installer Qualifications: The form liner installer shall have had a minimum of five consecutive years of experience in textured formed concrete construction.
3. Test Panel Mock-ups: Construct test panel mock-ups of the textured formed surface for quality control comparison of surface texture and pattern characteristics between the approved sample mock-ups and the actual work as it is installed. Test panel mock-ups shall be constructed using urethane foam or other suitable lightweight material to produce a surface that simulates that produced when casting concrete. The test panel mock-ups shall be a minimum of 5 inches thick, 8 feet wide, and 5 feet high. They must be lightweight and easily moved or transported by one person.
4. Concrete Test Panels: Upon approval of the test panel mock-up for the architectural concrete texture pattern, a concrete test panel for the texture shall also be constructed. At a minimum, the concrete test panel shall be the same size as the test panel mock-up. Materials used in the construction of the concrete test panel shall comply with the applicable requirements of 2401 for formwork and concrete. Concrete mix for the concrete test panel shall be Mix No. 3Y43 or Mix No. 3Y43 Modified (if lower shaft is poured as a mass concrete element as elected by the Contractor). . The form liner used for the concrete test panel shall produce the same pattern that is intended for use on the structure(s) with the formliner on one face and a smooth surface on the back. Cast the unreinforced panel vertically simulating as many phases of the actual construction as possible. Additional concrete test panels will be required if results of the initial test panel do not meet the requirements of these special provisions, which shall be considered incidental to the Work. Apply the Concrete Surface Finish (Multi-Color) Type A and the Anti-Graffiti Coating to the test panel and Concrete Surface Finish (Multi-Color) Type B to the smooth back side as designated below.

Following completion of construction of the bridges, remove and dispose of the test panels in accordance with 2104.3C3.

Test panels shall be considered incidental to the work and no direct compensation will be made therefore.

E. Construction Requirements

Surface Preparation: All conventionally formed concrete surfaces to receive weathered limestone texture shall be water blasted to break the surface film and to remove all laitance detrimental to the finish coating system performance. Sandblasting will not be allowed for cleaning concrete surfaces, as it will reduce the architectural concrete texture specified in this Special Provision. Pressure washing with water at a pressure of **3000 psi** at a rate of **3 to 4 gallons** per minute using a fan nozzle held perpendicular to the surface at a distance of **one to two feet** shall be used.

Match pattern features at form liner joints to make the formed concrete surface appear uniform and continuous without grout leakage at the joints. When concrete vertical construction joints are required, place form liner joints in the valley of the grooves, or as approved by the Engineer. Following removal of forms, finish minor defects to blend with the balance of the pattern surface texture. Filling of “bug holes” or other similar deformities in the texture surface that are 1/2 inch or less in diameter or depth is not required. No visible vertical and horizontal seams or conspicuous form marks created by butt-joining form liners will be allowed. Where it is not

possible to locate a vertical groove at a construction joint, the concrete surface shall be finished to reduce visibility of the construction joints.

Strip formwork in accordance with the form liner manufacturer's recommendations to avoid concrete surface deterioration or weakness planes in the substrate. Finish form tie holes in accordance with 2401.3F2a using approved patching materials.

Clean and repair surfaces of form liners to be re-used. Split, frayed, delaminated or otherwise damaged form liner material will not be acceptable for exposed surfaces. Form liners shall be cleaned and free of concrete buildup prior to each pour. Do not use "patched" forms for exposed concrete surfaces unless acceptable to the Engineer.

F. Method of Measurement

Measurement for Architectural Concrete Texture (Rock Face) will be made by the planimetric area in square feet of the textured surface based on the Plan dimensions.

G. Basis of Payment

Payment for Item 2411.618, "ARCHITECTURAL CONCRETE TEXTURE (ROCK FACE)" will be made at the Contract price per square foot and shall be compensation in full for all costs of constructing the textured surfaces, as described above, including the concrete test panel(s.)

SB-9.4 Architectural Surface Finish (Multi-Color)

A. Description of Work

This work consists of applying an architectural surface finish of a multi-color application to all exposed concrete surfaces of Architectural Concrete Texture (Rock Face) and to all exposed concrete surfaces of the upper concrete pier shaft as applicable to the new pier in this Project. The work shall be performed in accordance with the applicable provisions of Mn/DOT 2401, the Plans, and the following:

B. Architectural Surface Finish (Multi-Color) Application and Colors

Architectural Surface Finish (Multi-Color) shall be applied to the new pier faces so designated in the Plans to receive Architectural Concrete Texture (Rock Face) -designated as color "Type A". Architectural Surface Finish (Multi-Color) designated in the plans as "Type B" shall be applied to the new upper shaft pier faces..

Architectural Surface Finish (Multi-Color) Type A shall be a multi-color stain that matches the colors of the lower shafts of the existing stone piers (north and center) as shown above in the photos. The Contractor shall match the colors of the stone blocks for the existing north and center piers and submit the color information immediately to the Engineer after the field matching of colors.

Architectural Surface Finish (Multi-Color) Type B shall be a multi-color stain that matches the colors of the upper concrete shafts of the existing piers (north and center) as shown above in the photos. The Contractor shall match the colors of the upper concrete shafts for the existing north and center piers and submit the color information immediately to the Engineer after the field matching of colors.

Cork joints shown in the Plans shall be finished to visually continue the stonework pattern across the joint uninterrupted. A sample of the colored cork for approval shall be included in the concrete test panel described in SB-5.10D.4.

C. Stain Materials

Stain shall be a 100 percent acrylic; water-repellant, semi-opaque, tinted emulsion sealer designed for concrete and masonry surfaces. Acceptable products shall allow moisture and vapor transmission, be formulated

for exterior application with resistance to freeze/thaw, moisture, alkali, acid and mildew, mold or fungus, discoloration or degradation and meet the following requirements:

1. Physical or performance properties:
 - Volume Solids 29-31 percent (Calculated Lab Value)
 - Weight Solids 44-46 percent (Calculated Lab Value)
 - Viscosity 65-85 KU (Calculated Lab Value)
 - Accelerated Weathering 1,000 Hours Minimum (ASTM G-26)
2. Color pigments for tinted products shall be derived from synthetic mineral oxides.
3. Subject to compliance with requirements, provide colored concrete finishing products from one of the following manufacturers:
 - Harris Specialty Chemicals, Inc.
 - The Sherwin-Williams Company
 - Tamms Industries
 - TK Products
 - United Coatings
 - Other approved sources

To the greatest practical extent, all concrete finishing products shall be obtained from a single source.

All materials shall be furnished, prepared, applied, cured and stored according to the product manufacturer's directions and as specified herein. Special attention shall be given to the recommended temperature range for application.

D. Submittals by Contractor

Within 60 calendar days of execution and approval of the Contract, the Contractor shall submit the following to the Engineer for approval:

1. Product data including manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
2. Laboratory test reports showing that materials proposed for use meet physical or performance property requirements.
3. 12-inch x 12-inch square samples of the colors needed to complete the work. Final color selections will be based upon completion of the test panels specified above.
4. Proof that the concrete finisher has had five years experience finishing simulated stone masonry textured concrete. Include list of completed projects with project name and location and architect/engineer/owner of record.

E. Quality Assurance

The Contractor shall demonstrate his workmanship by completely finishing the architectural surface treatment concrete test panel(s), described in SB-5.10D.4 using approved concrete stain products, materials, methods and workmanship and the specified surface preparation method. Test panel(s) shall be considered incidental to the work and no direct compensation will be made therefor.

F. Surface Preparation

Following removal of forms, all exposed textured concrete surfaces shall receive an ordinary surface finish in accordance with Mn/DOT 2401.3F2a prior to the surface preparation described below. Minor defects shall be finished to blend with the balance of the textured surfaces. On heavily textured surfaces (i.e. ashlar stone, cut stone, fractured granite, etc.) only minor defects greater than 1/2" in diameter shall be finished to blend with the balance of the textured surface. The Contractor shall make every effort to match the surface texture of patched surfaces with the surrounding textured surface. Visible vertical or horizontal seams or conspicuous form marks shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

All formed concrete surfaces to receive Architectural Surface Finish (Multi-Color) shall be water-blasted to break the surface film and to remove all laitance detrimental to the color system performance. Sandblasting will not be allowed for cleaning concrete surfaces, as it will reduce the architectural concrete texture. Pressure washing with water at a pressure of 3000 lbs. Per Square Inch at a rate of 3 to 4 gallons per minute using a fan nozzle held perpendicular to the surface at a distance of 12 inches to 24 inches shall be used.

G. Method of Measurement

Measurement for Architectural Surface Finish (Multi-Color) applied to the Architectural Concrete Texture will be by area in square feet based on the dimensions of the finished colored plane surface area as shown in the Plans.

H. Basis of Payment

Payment for Item No. 2411.618 "ARCHITECTURAL SURFACE FINISH (MULTI- COLOR)" will be made at the Contract price per square foot and shall be compensation in full for all costs of furnishing and applying finishing materials to the areas of Architectural Concrete Texture (Rock Face) – Areas designated as "Type A" and to the areas of upper concrete pier shaft – Areas designated as "Type B" as described above.

Application of the Architectural Surface Finish to the concrete test panel(s) for quality assurance purposes shall be considered as incidental and no direct compensation will be made therefore.

SB-9.5 Mass Concrete

SB-9.5.1. General

It is the Contractor's responsibility to produce a structure free of cracks, which would result from heat of hydration during the curing of large concrete cross-sections. This work consists of temperature control of mass concrete for the purpose of minimizing potential cracking as a result of excessive temperature differentials due to the heat of hydration in the curing phase of large concrete cross-sections and for limiting the maximum temperature of concrete during the curing process. Temperature control of these structures shall be provided in accordance with ACI 207.1R-96, "Mass Concrete," ACI 207.2R-95 "Effect of Restraint, Volume Change, and Reinforcement on Cracking of Mass Concrete," and ACI 207.4R-93 "Cooling and Insulating Systems for Mass Concrete."

Flooding of cofferdams during the mass concrete curing period may produce significant thermal stresses, which may in turn result in substantial cracks within the concrete. The Contractor shall plan and schedule the construction activities for the mass concrete to minimize the potential of rapid temperature change due to flooding. Specifically, the placement of mass concrete for the within cofferdams will not be allowed between March 1 and May 15 of any given year.

Any concrete placement designated in the Plans, except for tremie seals, usually with a least dimension greater than 48 inches shall be considered mass concrete, to which the provisions herein apply. Regardless of size, tremie seal concrete will not be considered mass concrete.

SB-9.5.2. Temperature Limitations

The maximum temperature differential between the interior and a point 2 inches inside of the exterior surface, and the maximum peak concrete curing temperature shall be limited as described herein. These temperature conditions shall be maintained from time of concrete placement until all interior concrete temperatures are decreasing. Surface mounted temperature sensors will not be used to measure differential temperatures.

The temperature differential between the center of the placement and any point from the center of the placement 2 inches from an exposed face shall not exceed 45 degrees Fahrenheit as measured between any pair of temperature sensors contained in each placement. The maximum peak curing temperature of all mass concrete elements shall not exceed 160 degrees Fahrenheit.

SB-9.5.3. Temperature Control

The Contractor shall control the maximum temperature and interior and exterior temperature differential in the mass concrete in accordance with the following:

A. Submittals

At least 60 calendar days prior to scheduled concrete casting for mass concrete elements, the Contractor shall submit a heat generation and dissipation analysis to the Engineer for approval indicating how temperature controls are to be achieved together with proposed concrete design mix, casting procedures and material information. The submittal shall include, but not be limited to, the following:

1. Heat generation and dissipation analysis in accordance with ACI 207.1R-96 for the geometry of each mass concrete element. The analysis shall determine the predicted concrete temperature at the center and 2 inches inside of the exterior surface exposed to air for a time period until all temperatures are decreasing. Analyses shall be performed for the anticipated mean weekly ambient air temperatures for the period of the proposed placement, and for temperatures plus, and minus, 10 degrees Fahrenheit of the mean weekly ambient air temperature.
2. Anticipated concrete placement temperatures measured at discharge into the forms for the mean weekly ambient air temperatures, and temperatures plus, and minus, 10 degrees Fahrenheit of the mean weekly ambient air temperature.
3. A copy of any software and software license and software models, such as the Schmidt model, with the site and element specific input data and results.
4. The method(s) that are intended to be used for maintaining a maximum temperature differential between the interior and 2 inches inside of the exterior surface of the designated mass concrete elements, and a maximum peak curing temperature, at the anticipated mean weekly ambient air temperatures in which the element is intended to be cast.

B. Temperature Monitoring

The Contractor shall provide temperature monitoring devices to record temperature development between the interior and 2 inches inside the exterior surface of each element at points approved by the Engineer. A minimum of two independent sets of interior and exterior points shall be monitored for each element to provide redundancy in case of monitoring device failure. Both sets of monitoring points shall be located along the shortest line from the geometric center to the nearest exterior exposed surface of the structure as such: 1) one sensor at the geometric center of the structure and one sensor at 2 inches from the nearest exposed exterior surface. The minimum number of sensors for each pour shall be two sets of two, or a total of 4 sensors.

The temperatures shall be recorded automatically by an approved strip-chart recorder furnished by the Contractor. Connect sensing devices with armor sheathed wire.

The monitoring devices shall be read by the Contractor, beginning when casting is complete and continuing until the maximum concrete temperature has decreased for a period of not less than thirty-six (36) hours. Furnish temperature-monitoring records to the Engineer daily.

If monitoring indicates the maximum temperature differential or the maximum curing temperature will, in the determination of the Engineer, or has, exceeded the maximums the Contractor shall take immediate action to retard further growth in the differential or maximum temperatures. Additionally, the Contractor shall make the necessary revisions to the approved plan to not exceed the maximum differential and maximum curing temperatures on any remaining placements. Revisions to the approved plan must be approved by the Engineer prior to implementation.

SB-9.5.4. Crack Repair

The Contractor shall seal all mass concrete cracks between 0.010 inches (0.25 mm) and 0.020 inches (0.51 mm) in width, with a Mn/DOT approved epoxy crack sealant applied in accordance with the manufacturer's recommendations.

Mass concrete cracks between 0.020 inches (0.51 mm) and 0.060 inches (1.50 mm) in width shall be filled using a Mn/DOT approved epoxy injection system and materials. The epoxy injection operation shall be in accordance with the material and equipment manufacturer's published recommendations.

Mass concrete cracks greater than 0.060 inches (1.50 mm) in width shall be evaluated by the Engineer to consider whether these cracks compromise the integrity of the design or fitness for use. If the Engineer asserts that these cracks do not compromise the integrity of the design or the fitness for use, the Contractor shall submit a repair plan for the Engineer's approval.

Cracks shall not be repaired until all concrete cooling operations are completed. All injection ports, excess epoxy and sealing epoxy shall be removed from the concrete surface.

SB-9.5.5. Method of Measurement

No measurements for the work associated with Mass Concrete will be taken if the Contractor is required to use Mass Concrete procedures.

SB-9.5.6. Basis of Payment

The Contractor's required uses of Mass Concrete procedures are considered an incidental expense to the respective concrete mixes for this construction, and no additional compensation will be made for this work.

SB-9.6 Anti-Graffiti Coating

Description of Work

This work consists of applying an anti-graffiti coating to designated areas shown in the Plans of the new south pier vertical surfaces above finished grade. The work shall be performed in accordance with the Contract Documents and the following:

Materials

Anti-Graffiti Coatings

Anti-graffiti coatings shall be a clear, multi-component, multi-coat system designed as a permanent, non-destructive coating system for exterior architectural aesthetics. Product shall be compatible with any

surface sealer and/or special surface finish that may have been previously applied to the concrete surfaces. It shall be non-yellowing, non-chalking, and UV-resistant, available in a flat, matte, or semi-gloss finish, and shall not require re-application after graffiti removal. Coating shall not contain paraffin (wax) or elastomeric silicones. Acceptable products shall demonstrate protection from graffiti defacement, chemical staining, ghosting, shadowing, and normal environmental effects without yellowing, color change, increased dirt pick-up, or damage to the coating or substrate for a minimum 10-year period.

Acceptable anti-graffiti coating products are as follows:

1. Graffiti Solution System as manufactured by American Polymer Corporation
2. Conformal Anti-graffiti Coating as manufactured by Chemprobe Technologies, Inc.
3. Permaclean 1496 as manufactured by TK Products
4. Other products Approved by Mn/DOT

Graffiti Removal Agents

Graffiti removal agents shall be non-toxic, non-flammable, biodegradable, and have a pH of 7-8.5. After graffiti removal, no evidence of graffiti shall be present. The product(s) shall not cause a change in the appearance to the treated surface, including shadowing, ghosting, or staining of the coating or substrate.

Submittals

Submittals shall be made prior to material being incorporated in the work. The Contractor shall allow sufficient time so that construction will not be delayed as a result of the time required to approve the submittals, including time for resubmittals as necessary. An extension of time will not be authorized because of failure to transmit submittals sufficiently in advance of the work.

The Contractor shall submit the following items to the Engineer:

1. Manufacturer's product data sheets indicating technical information, label analysis, and application instructions for each material proposed.
2. For the purpose of future maintenance, a list of manufacturer-approved products for cleaning of the surface of the anti-graffiti coating product(s) used on the Project.
3. Certified test reports indicating compliance with requirements.
4. A one-liter sample of each anti-graffiti coating product and a compatible graffiti removal agent for verification purposes.
5. Applicator qualifications demonstrating experience in coating applications. Include a list of recently completed graffiti-resistant coating projects. Supply name and location of project, name and telephone number of owner, and a description of products used, substrates, applicable local environmental regulations, and application procedures.

Quality Assurance

All products applied under this Project shall be supplied by the same manufacturer. Coating and removal products shall demonstrate a history of successful use on transportation, commercial, or industrial projects.

The approved coating manufacturer shall conduct a training seminar for the purpose of training applicators on anti-graffiti product technology, substrates, and application methods. Applicator trainers shall be approved by, and shall be in good standing with, the manufacturer.

Application

Anti-graffiti coating shall be applied after all components of the Architectural Concrete Finish have been applied to the areas of architectural concrete texture.

The substrate shall be prepared and the anti-graffiti coating product(s) shall be applied in accordance with the manufacturer's directions.

Prior to full application of the anti-graffiti coating to the designated surfaces, the applicator shall apply the anti-graffiti coating to the test Panel described above under sections Architectural Concrete Texture (Rock Face) and Architectural Surface Finish (Multi-Color) to confirm compatibility, coverage, and possible color change. Any problems or damage to the concrete surfaces as a direct result of the anti-graffiti products or face preparation methods shall be corrected to the satisfaction of the Engineer.

Method of Measurement

Measurement will be made to the nearest square foot of the new pier vertical concrete surface areas designated to receive the Architectural Concrete Texture (Rock Face)-Areas designated "Type A" that are exposed to view.

Basis of Payment

Payment for Item No. 2411.618 "ANTI-GRAFFITI COATING" will be made at the Contract price per square foot and shall be compensation in full for all costs of labor, equipment, materials, and all incidentals thereto necessary for the surface preparation, application, and clean-up associated with this work.

SB-10 (2402) STEEL BRIDGE CONSTRUCTION

This work shall be performed in accordance with the provisions of Mn/DOT 2402 except as modified below:

Delete the first paragraph of 2402.3D and substitute the following:

At least six weeks before starting construction of the structural steel erection falsework, the Contractor shall supply the Engineer with three copies of the detailed Plans and Specifications and two copies of the associated calculations of the proposed system for constructing the falsework. Design of the falsework shall be in accordance with AASHTO "Guide Design Specifications for Bridge Temporary Works". The Plans and Specifications shall be prepared by an Engineer, thoroughly checked by a second Engineer for completeness and accuracy, and certified by one of the aforementioned professional Engineers licensed in the State of Minnesota. The documents shall include sufficient details so that construction of the proposed system can be completed solely by reference to the Plans and Specifications. The design criteria shall be shown on the first sheet of the Plans.

Delete the first paragraph of 2402.3F and substitute the following:

Structural steel members shall be erected in a manner that will provide safety to the workers, inspectors, and the public, at all times, as well as reasonable assurance against damage to the steel members. Prior to placement of diaphragms, the primary members, such as beams and girders, shall be temporarily anchored, braced, and stabilized as they are erected so as to preclude sliding, tipping, buckling, or other movement that may otherwise occur.

If active vehicular or railroad traffic will be permitted to travel beneath beams prior to complete erection of all the beams and diaphragms in a span, the Contractor shall submit an erection plan prepared by an engineer, thoroughly checked by a second engineer for completeness and accuracy, and certified by one of the aforementioned professional engineers licensed in the State of Minnesota which details all temporary works necessary to brace and stabilize beams. Struts, bracing, tie cables, and other devices used for temporary restraint shall be of a size and strength that will ensure their adequacy. Plans shall specify the required bolt tension and number of bolts to be installed in permanent diaphragm connections and in other bracing necessary to stabilize the beams. The Contractor shall arrange the work schedule so that at least two adjacent girders will be erected (including diaphragms and bolts fully tightened) and braced in any one span before operations are suspended for the day.

The last sentence of 2402.3F, paragraph (3), is hereby modified to read as follows:

Connections for primary members, diaphragms, and other secondary members shall have a sufficient number of holes filled with erection pins and bolts so that the plates are drawn into full contact and so that the holes are properly matched prior to placing the permanent connectors.

SB-10.1 Bolted Connections

All bolted field connections for steel bridges shall be prepared and installed using Direct Tension Indicator (DTI) washers. DTIs shall conform to the requirements of 3391 and ASTM F 959. All DTIs shall have unique markings to indicate the gap locations between the protrusions and to allow the inspector to visibly differentiate them from a standard washer after installation. DTIs shall be supplied mechanically galvanized in accordance to 3392.

Installation of fasteners shall be in accordance with the DTI manufacturer's recommendations and 2402. Installation shall also meet the requirements of AASHTO LRFD Bridge Construction Specifications, Second Edition, Article 11.5.6.4.7 Direct Tension Indicator Installation Method. A DTI manufacturer's representative shall be on-site at the beginning of the bolting operations to provide training and ensure proper installation.

Use of DTIs, as described above, shall be considered as an incidental expense to the structural steel and no direct compensation will be made therefore.

Delete the first sentence of 2402.3G2c(3) and replace it with the following:

When direct tension indicators are used to provide the required bolt tension, installation of the indicators, including snug tight fit-up, shall be in accordance with the manufacturer's recommendations, except as follows. Insert a hardened flat washer between the DTI and fastener when bolting through a short-slotted or oversized hole as per MnDOT 2471.3H1a. Installation of a DTI will be permitted under the turned element if a washer is used to separate the turned element from the DTI per AASHTO LRFD Bridge Construction Specification 11.5.6.4.7.

SB-10.2 Assemble and Install Salvaged Bridge

The work required to assemble and reinstall the salvaged steel deck girder span are summarized below:

1. Prepare the salvaged steel deck girder span that is presently supported on blocking on the east bank of the river to allow lifting and relocation work to set the existing span structure in place supported by the new west concrete pier and the existing center pier.
2. Reinstall the existing salvaged bearing plates on the top bearing shelf of the center pier. Install new bearing assemblies on the top bearing shelf of the new south pier.
3. Reinstall the salvaged steel deck girder span on the bearing assemblies.
4. Reconstruct the adjacent existing timber trestle span as required. Reinstall the salvaged timber end bent to support the existing timber trestle span on the top bearing shelf of the new west pier. Replace damaged or missing timber components of the trestle span end bent as required with new timber components. Use salvaged timber fasteners that are not damaged. Damaged salvaged or missing timber fasteners shall be replaced with new timber fasteners.
5. Reconstruct the salvaged timber deck construction as required. Salvaged timber components should include ties, blocking, decking, railposts, and railings. Replace damaged or missing timber components as required with new timber components. Use salvaged timber fasteners that are not damaged. Damaged salvaged or missing timber fasteners shall be replaced with new timber fasteners.

6. Conduct all incidental bridge related work as required to reopen the Red Jacket Trail Bridge to the public.
7. Collect, store, and dispose of all debris generated from the bridge reinstallation and reconstruction work as required and approved by the Engineer.

The Contractor shall prepare a Bridge Assembly and Reinstallation Plan stating the step-by-step work tasks required to complete the assembly and reinstallation of the salvaged steel deck girder span and the timber trestle span. The Assembly and Reinstallation Plan shall include details and procedures for lifting, relocating, and setting the salvaged steel deck girder span on the center and new west piers. The Assembly and Reinstallation Plan shall be submitted to the Engineer for review and acceptance prior to the Contractor commencing work on the site.

The Contractor shall exercise care during the span preparation and reinstallation work not to damage the salvaged spans. If required, the Contractor shall: grind down rivet heads and punch out existing rivets at gusset plates that are shared; partially dismantle and remove timber rail and timber decking to permit salvaging of either span; etc.

The estimated dead load weights of the two spans to be salvaged are as follows:

Steel deck girder span:	158 to 188 kips
Timber trestle span:	30 to 40 kips

The dead load weights and reactions noted are total loads including the steel girders and timber elements (ties, fillers, decking, railings, etc).

The estimated original geometrics of the steel deck girder span, the timber trestle span, and the new south pier are shown in the Plans. The geometrics shown for the two spans are approximate. The Contractor shall field measure dimensions of the structures as required to perform the reinstallation work.

If required due to weight, the Contractor may partially or fully salvage the timber elements of the deck girder span. As a minimum, the two steel deck girders with cross frames and lateral bracing shall be salvaged and relocated as a unit. If the timber elements of the steel deck girder span are dismantled and salvaged, the timber elements along with connection hardware shall be temporarily stored and covered adjacent to the steel deck girder unit in a manner to avoid collection of water on the timber elements and hardware.

Materials required to be salvaged and reinstalled that are damaged while being moved by the Contractor or while in the care of the Contractor shall be replaced or repaired to the satisfaction of the Engineer and at the Contractor's expense.

Collect, store, and dispose all debris generated from the bridge reinstallation and reconstruction work as required and approved by the Engineer. The Contractor shall clean up the project site when work is complete to the satisfaction of the Engineer. Refer to Section SB-20.

Method of Measurement

All work associated with the assembly, reinstallation, and reconstruction of the salvaged spans will not be measured.

Basis of Payment

Payment for all work associated with the assembly, reinstallation, and reconstruction of the salvaged spans shall be included in the Contract per lump sum for Item No. 2402.601 "ASSEMBLE AND INSTALL SALVAGED BRIDGE". Work included the lump sum pay item shall include: Work required to prepare the assembly and reinstallation plan to be submitted to the Engineer for review and acceptance; Work required to prepare the salvaged steel deck girder span and the timber trestle approach span for relocation and reinstallation;

Work required to reinstall and reconstruct the salvaged steel deck girder span and the adjacent timber trestle span.; Work required to reconstruct the timber decking, railposts, and railings,; and All incidental work required to successfully complete the partial removal and salvage work.

Work associated with the collection, storage, and disposal of regulated waste material generated during the assembly and reinstallation work shall be included in the Contract per lump sum for Item No. 2401.601 "REMOVE REGULATED WASTE (BRIDGE)". Refer to Section SB-20.

SB-11 (2403) TIMBER BRIDGE CONSTRUCTION

A. Requirements:

The Contractor shall reuse salvaged timber components unless damaged.

New replacement timber components shall be as follows:

Timber decking shall be Douglas Fir-Larch, No. 1 or better (Fb = 1150 psi minimum) per the provisions of 3426 and preservative treated as described below. Planks shall be S4S. Nominal thickness shall be a minimum of 3 inches. As an alternate, White Oak or other decay resistant domestic woods may be used for the deck as approved by the Engineer.

Timber railing, railposts, curbs, and bolting blocks shall be Southern Yellow Pine, No. 2 or better, per the provisions of 3426 and preservative treated as described below.

All other timber shall be Douglas Fir-Larch, (Fb = 1200 psi minimum) per the provisions of 3426 and preservative treated as described below.

B. Fasteners:

Screws, nuts, bolts, washers, etc., used for attachment of decking shall be hot dip galvanized.

C. Preservative Treatment:

Decking, railing, railposts, curbs, and bolting blocks shall be pressure treated with a waterborne non-arsenate based preservative per 3491.

All other timber components in locations preventing personal contact shall be pressure treated with creosote oil preservative per 3491.

Wood shall be pre-cut and/or predrilled prior to treatment whenever possible, otherwise, all field cuts, drillings, notches, etc., in wood over 2" nominal thickness shall be coated with two heavy coats (minimum) of preservative compatible with existing preservative treatment.

D. Handling Treated Products:

Care and handling of preservative treated wood products shall be in accordance with AWPAS Standard M4.

SB-12 (2433) STRUCTURE RENOVATION

The provisions of Mn/DOT 2433 are modified and/or supplemented with the following:

SB-12.1 Anchorages

Each anchorage shall be furnished and installed in accordance with the applicable requirements of 2433 and the following:

Adhesive type anchors shall be used unless otherwise specified in the plans.

Anchorage shall be compatible for use drilled into existing stone.

Except when part of a proprietary anchorage assembly, threaded rods and bolts shall meet the requirements of 3385 and 3391, respectively.

Threaded rods, bolts, nuts, and washers not encased in concrete after project completion shall be galvanized in accordance with 3392 or be electroplated in accordance with ASTM B 633, Type III, SC 4. As an alternate to galvanizing or electroplating, threaded rods, bolts, nuts, and washers which are part of a proprietary anchorage may be fabricated from stainless steel in accordance with 3391.

	Anchor Rod Type	Bolt or Rod Diameter <u>inches</u>	Minimum Embedment Depth <u>inches</u>	Minimum Ultimate Pull-out Strength <u>pounds</u>
<u>Location</u> Center Pier	B	$\frac{3}{4}$	7	24,020

Anchorage for which the Contract specifies an ultimate pull-out strength shall be installed into sound concrete/stone to a depth of at least six times the bolt or rod diameter, unless a different depth is specified elsewhere in the Contract. Bolt heads and/or nuts for such anchorages shall be in contact with the adjacent surface and shall be torqued to approximately 108 N m (**80 ft pounds**) unless a different torque is recommended by the manufacturer. Adhesive anchorages shall consist of a continuously threaded rod secured by an adhesive or mortar. Installation of anchorages shall be in accordance with the manufacturer's recommendations and as specified in the Plans.

Laboratory tests that include static load tests for ultimate pullout strengths shall be performed on anchorage systems that are subject to tensile loads. The tests, in accordance with ASTM E 488, shall be performed and certified by an independent testing laboratory. The Contractor shall furnish the Engineer with the test reports and the specification sheets that are prescribed by ASTM E 488.

The Contractor shall submit, for approval by the Engineer, the following anchorage supplier's product literature or calculations to establish embedment depth. This information will demonstrate compliance with the specification:

- Name of supplier
- Full product name (as given in supplier's literature)
- Embedment depth as determined from supplier's literature

The Contractor shall demonstrate the anchorage system for drilled in anchorage systems at the first site of field installation prior to actual use in the project. The demonstration shall include installation and static tension tests in the presence of the Engineer in accordance with test procedures prescribed in ASTM E 488. No portion of the testing device shall bear on the concrete surface within a distance equal to the anchorage embedment depth. Three anchorages shall be tested to not less than 1/2 the required minimum ultimate pull out strength or the value given in Table 1, whichever is less. Failure of any anchorage tested will require modification of installation procedures or use of a different anchorage system.

In addition to the three tests stated above, the Engineer will require that each bridge have an additional 2% (not less than 1 test) of the remaining anchorages tested at a latter date. The Engineer will determine the locations of the additional anchors. If a failure occurs while testing the additional 2%, more testing

will be required at the rate of an additional 1% per each failure at the Contractor's expense. Compensation for costs of testing is included in the payment for anchorage type 1.

TABLE 1

ANCHOR ROD PROOF LOADS, KN (kips)
TYPE OF ROD, FROM SPEC. 3385

DIA., mm (inches)	TYPE A	TYPE B	TYPE C	TYPE D
13 (1/2")	21.0 (4.75)	25.0 (5.7)	45.0 (10.1)	22.0 (4.9)
16 (5/8")	33.0 (7.4)	39.5 (8.9)	70.0 (15.8)	34.0 (7.6)
19 (3/4")	47.0 (10.6)	56.0 (12.6)	101.0 (22.8)	49.0 (11.0)
22 (7/8")	65.0 (14.5)	77.0 (17.4)	138.0 (31.0)	67.0 (15.0)
25 (1")	85.0 (19.0)	100.0 (22.6)	180.0 (40.5)	86.0 (19.5)

If anchorages are installed vertically and are not encased in concrete after project completion, any voids occurring between the top of the anchorages and the concrete in which it is embedded shall be filled with approved caulk.

Payment will be made as 2433.516 "ANCHORAGES TYPE 1", at the contract price per each, which shall include all costs of furnishing, testing, and installing the anchorages.

SB-12.2 Repair Structural Cracks (Epoxy Injection)

SB-12.2.1. Description

Furnish and apply a epoxy injection system and materials to the cracks designated in the Plans to be repaired on the upper portion of the center and north piers. The injection shall not occur until the steel bands have been installed and tightened. Perform this work in accordance with the applicable provisions of MnDOT 2433, the Plans, as directed by the Engineer, and the following:

SB-12.2.2. General

Apply a MnDOT approved epoxy injection system and materials. Provide the Engineer with the epoxy sealant Manufacturer's written instructions for application and use, at least 30 calendar days before the start of the work.

SB-12.2.3. Materials

Furnish only one of the epoxy injection systems and materials on the Department's "Approved/Qualified Product Lists of Epoxy Crack Sealers" (<http://www.dot.state.mn.us/products/index.html>). For products not on the Department's prequalified list, provide information as required on the web site.

SB-12.2.4. Application Requirements

A. Pre-Application Meeting

Prior to application of the sealant, hold a meeting with the Manufacturer's Representative, the Engineer, and the Contractor to discuss all necessary safety precautions and application considerations.

B. Crack Preparation

Clean all cracks to be sealed by removing dirt, dust, oil, grease, curing compounds, waxes, laitance, or other contaminants. Immediately before preparation and injecting the sealer, direct a 125 psi air blast, from a compressor unit with a minimum pressure of 365 ft³ / min., to carefully clean all cracks. Use a suitable oil trap between the air supply and nozzle. Provide shielding as necessary to prevent dust or debris from striking vehicular or pedestrian traffic. Have the Engineer approve the prepared cracks prior to injecting the sealer.

Prepare and clean the cracks in accordance with product manufacturer recommendations.

Apply the surface seal and injection ports to contain the adhesive to a clean surface in accordance with manufacture's requirements.

Install and tighten the steel bands prior to injecting epoxy. Remove surface sealant and ports after placement and sufficient cure of the epoxy.

C. Weather Limitations

Do not apply sealant materials during wet weather conditions or if adverse weather conditions are anticipated within 12 hours of the completion of sealant application. Do not mix or apply any of these products at temperatures lower or higher than those specified in their product literature. Apply the sealant at the coolest time of the day within these limitations.

D. Sealant Application

Do not thin or alter the sealant unless specifically required in the Manufacturer's instructions. Mix the sealant before and during its use as recommended by the Manufacturer. Apply the sealant in accordance with manufacturer's instructions.

Allow the sealant to dry according to the Manufacturer's instructions.

SB-12.2.5. Method of Measurement

Measurement will be made to the nearest foot of concrete crack length sealed based on lineal foot of crack repair.

SB-12.2.6. Basis of Payment

Payment for Item No. 2433.603 "REPAIR STRUCTURAL CRACKS (EPOXY INJECTION)" will be made at the Contract price per lineal foot and shall be compensation in full for all costs of furnishing, preparation, and injecting the sealant into the concrete cracks, as described above, including all preparation, and all incidentals thereto.

SB-12.3 Cement Grout

SB-12.3.1. General

The provisions of Mn/DOT 2461 are modified in accordance with the following:

The following shall be added to Mn/DOT 2461.3Bng:

The Department will designate grout by type and grade followed by the word "GROUT." Do not provide grout containing coarse aggregate. If the Plans do not show a type or grade for grout, provide 3A GROUT.

SB-12.3.2. Method of Measurement

Cement grout will not be measured on this Project.

SB-12.3.3. Basis of Payment

No payment for 3A GROUT will be made on this Project. The costs of furnishing, preparation, and placement of 3A GROUT shall be incidental to the Work associated with the fabrication and installation of the steel armor at the existing center pier.

SB-13 (2442) REMOVAL OF EXISTING BRIDGES

The provisions of Mn/DOT Specification 2442 shall apply except as supplemented herein.

Disposal of materials by the Contractor shall be in accordance with 1506, 2104.3C, 2442, Mn/DOT "Asbestos and Regulated Waste Manual for Structure Demolition or Relocations for Construction Projects" and the following: The Contractor shall furnish written information to the Engineer as to disposal of regulated waste generated during the partial removal and salvage work. This information shall include method of stabilization and disposal; name, address, and telephone number of disposal site; certification that Contractor has notified disposal site of presence of lead paint; acknowledgment by Contractor of OSHA requirements relating to lead; and certification that Contractor is familiar with proper handling and disposal of materials with lead-based paint systems. All partial removal and salvage work required for the Project shall be in accordance with the Mn/DOT "Asbestos and Regulated Waste Manual for Structure Demolition or Relocations for Construction Projects".

SB-14 (2442) REMOVAL OF EXISTING BRIDGES MIGRATORY BIRD PROTECTION

Bidders are advised that bridge sites such as those in this Contract are usually attractive places for swallows and phoebes to build nests and raise their young.

Bidder's attention is directed to the fact that swallows are protected by the Federal Migratory Bird Treaty Act 50 CFR 21, and the knowing destruction of swallows or their active nests is a felony punishable by a fine and/or jail term. Existing Bridge No. 3722 is known to support nesting swallows. Cliff swallows and barn swallows often build their nests on bridges that are over or near water.

The first priority for this Project is for the Contractor to take measures to prevent birds from building new nests before May 15 and until such time as the bridge construction activities are completed, or no longer threaten the nests. Birds should also be prevented from using old nests from the previous season. Old nests can be removed. An active nest is a nest with eggs or chicks. An unfinished nest is not considered active unless eggs have been laid. Acceptable measures include hosing or knocking down any unfinished or inactive nest as it is being built. To prevent nesting, cover the undersides and nesting surfaces of the bridge with tamps, fabric or netting to prevent nesting. No permit is required as long as this activity is done prior to May 15 or the active nesting period.

If it is impossible to remove nests prior to May 15, the Contractor must obtain the required depredation permits and deal with the swallows on the bridge in a manner that is acceptable to the U.S. Fish and Wildlife Service (USFWS) and the Minnesota Department of Natural Resources (DNR). Depredation permits from the USFWS are required for the destruction of migratory bird nest on bridges during the nesting season (May 15 to September 1). The DNR also has permit authority over protected wildlife. USDA Animal Damage Control is also involved. The contact persons for obtaining the depredation permits are as follows:

Marilyn Balancer
U.S. Fish & Wildlife
Migratory Bird Office
Federal Building, One Federal Drive
Fort Snelling, MN 55111-4056
Phone: (651) 725-3313
Fax: (651) 725-3509

Blair Joselyn
Research Unit Supervisor
Dept. of Natural Resources
Lafayette Road
St. Paul, MN 55101
Phone: (651) 296-3344

USDA - APHIS
ADC
316 North Roberts Street
St. Paul, MN 55105
Phone: (651) 290-3156

The Contractor should allow a minimum of 21 days for processing the permit request.

All permits issued by the USFWS contain the requirement that any young swallows and eggs removed from the bridges must be turned over to a licensed rehabilitator for care and subsequent release. The rehabilitator must be contacted prior to the removal of any active nests to make sure that their services will be available. Contact the Department of Natural Resources' Central Office for federal licensed rehabilitators.

Summary

- (1) Bridge work may be performed outside of the nesting season, i.e., before May 15th or after September 1st. No permit is required for this activity unless active nests are involved.
- (2) The portions of the bridge providing nesting sites (undersides, overhangs, and ledges) may be covered with tarps, fabric or netting to prevent the birds from nesting. Other acceptable options are to diaper the underside of the bridge or hang filter reinforced with wire mesh from the side of the bridge to a foot below the water line. No permit is required for this activity. These measures should be implemented before May 15.
- (3) Old nests from the previous year and unfinished nests (Not Active = No eggs or chicks present) can also be removed by hosing or knocking the nests down. No permit is required for this activity as long as it is done before May 15.
- (4) Bridge work may be begun on August 15th in the hope that all or most of the birds will have completed nesting for the season. The risk with this approach is that some late nesters may still be present. If birds are still present, they must be turned over to a licensed rehabilitator. This activity requires a permit whenever there are active nests.

All costs of getting the necessary permit, rehabilitators, screening, properly disposing of swallow nests and/or swallows and eggs from the bridge, and all other work associated with removal of swallow nests shall be considered incidental to bridge construction.

SB-15 (2451) STRUCTURE EXCAVATIONS AND BACKFILLS

The provisions of Mn/DOT 2451 are modified and/or supplemented with the following:

SB-15.1 Structure Excavation

The item Structure Excavation shall include all temporary work to access pier location, excavation, sheeting and shoring, cofferdam work, pumping, and/or other protection, preparation of foundation, and

placing of backfill necessary for construction of Bridge No. 6961. It shall also include the disposal of surplus material.

No measurement will be made of the excavated or backfill material. All work performed as specified above will be considered to be included in a single lump sum for which payment is made under Item No. 2401.601, "STRUCTURE EXCAVATION".

For purposes of partial payments, the portion of the lump sum Structure Excavation at each substructure unit will be defined as follows:

Bridge 6961	South Pier 100%
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SB-15.2 Slope Preparation

The item Slope Preparation shall include all excavation, backfill, and slope preparation work required to permit placement of riprap and the granular filter at the south pier location in the Project,

No measurement will be made of the excavated or backfill material. All work performed as specified above will be considered to be included in a single lump sum for which payment is made under Item No. 2401.601, "SLOPE PREPARATION".

SB-15.3 Foundation Preparation (South Pier)

Each item of work Foundation Preparation (South Pier) shall consist of furnishing all material for and performing all work involved in the preparation of the foundation for each of the piers designated. Unless otherwise provided by separate Contract item, each item shall include, but not be limited to temporary work to access pier locations, earth excavation and all other work such as coffer dam construction, concrete seals, pumping, removal of the cofferdam and other temporary works, backfilling the excavation, and disposal of surplus excavated materials as may be necessary. As requested by the Contractor, partial payment for Foundation Preparation items may be made based on the Engineer's estimate of percent of work complete.

Piling will be paid for separately.

All costs for the work specified above for each of the piers will be paid for separately as Item No. 2401.601 "FOUNDATION PREPARATION (SOUTH PIER)", at the contract lump sum price per each pier.

SB-16 (2452) STEEL SHEET PILING (PERMANENT)

This work shall consist of furnishing and driving steel sheet piling in accordance with Mn/DOT 2452, at the locations in the Plans, and the following:

This work consists of designing, furnishing, installing and trimming of tops of permanent steel sheet piling as required for the purposes of aiding the construction of the new south pier piling, footing, and shaft and excavations. Contractor shall determine required locations and lengths for the permanent steel sheet piling based on the construction shown in the Plans.

The steel sheet piling may be cold formed or hot rolled "Z" or "flat" sheet piling. The same pile section shall be used for all sheet piling. The piling shall have a minimum web thickness of 0.300 inches. No coating is required. The Contractor shall furnish new sheet piling.

The sheet piling shall be straight and vertical.

The Contractor will be allowed to design the permanent sheet piling as a cofferdam for the pier construction with the top of the cofferdam sheets extending above the top of footing as desired by the Contractor. If this option is used, the tops of the permanent sheet piling shall be cut off at the top of the pier footing elevation before the project is complete.

At least three weeks before starting construction of the permanent steel sheet piling, the Contractor shall provide the Engineer with information on the sheet pile manufacturer, section shape and web thickness, and steel material for Approval. If the Contractor intends to use the sheet pile as a cofferdam, a layout drawing shall be provided for information purposes only.

Measurement for Item No. 2452.618, “STEEL SHEET PILING (PERMANENT)” will be made by the square foot of sheet piling installed with a height from the top of the pier footing elevation down to a sheet piling tip elevation of as shown in the Plans.

All costs for the work specified above will be paid for as Item No. 2452.618, “STEEL SHEET PILING (PERMANENT)”, at the contract square foot price and includes all work including design, submittals, fabrication, installation, and final incidental works.

SB-17 (2452) PILING

The provisions of Mn/DOT 2452 are modified and/or supplemented with the following:

Delete the second paragraph of 2452.3H and substitute the following:

Pile welders shall be qualified using AWS D1.1 standards or current Mn/DOT welding certification.

Delete the first sentence of the second paragraph of 2452.3D7 and substitute the following:

Piles designated by the Engineer to be redriven shall have a required minimum time delay of 72 hours between the initial driving and redriving.

SB-17.1 Equipment for Driving

Delete the first and second paragraph of 2452.3C1 and substitute the following:

All pile driving equipment to be furnished by the Contractor shall be subject to approval by the Engineer. Approval is based on the satisfactory results of a wave equation analysis.

At least 30 calendar days prior to the start of pile driving operations, the Contractor shall submit the following:

1. A completed pile and driving equipment data form for each hammer proposed for the project. The form may be downloaded from the following website:
<http://www.pile.com/pdi/users/grlweap/equipdataform-en.pdf>
2. A wave equation analysis in accordance with GRL WEAP or similar program for each pile type and hammer. A hard copy of the results of the analysis, including a WEAP bearing graph, shall be submitted to the Engineer.

For the pile driving equipment to be acceptable, the required number of hammer blows indicated by the wave equation at 155% of the pile factored design load as shown in the Plans shall be between 30 and 180 blows per foot.

The pile stresses indicated by the wave equation shall be reviewed to determine that the piles can be driven as described in 2452.3D without failure. If stress levels are such that damage to the piling is considered to be likely, adjustments shall be made to the pile driving system or to the strength of the pile until satisfactory results are obtained. Substantial refusal is defined in subsequent paragraphs.

All costs associated with providing the wave equation analysis and submittals as described above shall be an incidental expense to the test piles and no additional compensation will be made for this work.

SB-17.2 Penetration and Bearing

Delete 2452.3E and substitute the following:

A. General

The nominal pile bearing resistances shown in the Plans were calculated using design loadings and indicate the factored loads that the piles are required to support. The nominal resistance determined using the dynamic methods, defined under Determination of Nominal Bearing Resistances, is the basis for establishing the minimum criteria for pile acceptance in which the driving resistance is not less than the resistance specified in the Plans. It may be necessary to drive the foundation piles beyond the specified resistance until the required penetration as shown in the Plan is reached, or until the piles have been driven to a penetration as determined by the engineer based on the test pile results.

Since the purpose of a test pile is to provide information for authorizing the length of the foundation piles, it shall be driven full length unless substantial refusal (as defined below) is encountered at a lesser penetration. If the test pile has been driven full length and 115% of the nominal resistance required for the foundation piles has not been attained the Engineer may order the test pile be driven further as per 2452.3D2 and 2452.4A. If pile redriving is specified in the Plan, the penetrations and time delays shall be in accordance with 2452.3D7 and/or these special provisions.

Substantial refusal, as referenced in 2452.3D, shall be considered to have been attained when the penetration rate is equal to 0.05 inches per blow.

B. Determination of Nominal Bearing Resistance

The required nominal resistance shown in the Plans is based on a field control method as noted. The driven pile nominal resistance shall be determined in accordance with the following provisions using the appropriate corresponding field control method indicated in the Plans. Unless otherwise specified, if more than one field control method is shown, the method used shall be determined in accordance with the following:

- When the "Pile Analysis" pay item is included for a bridge, the Pile Driving Analyzer (PDA) shall be required for the field control.
- When the "Pile Analysis" pay item is not included for a bridge, the field control method shall be at the Contractor's option. The cost of the PDA shall be incidental to the cost of Piling Driven.

B1. Mn/DOT Nominal Resistance Pile Driving Formula Used as Field Control Method

The nominal pile bearing resistance shall be determined by dynamic formula as follows:

All types of piling driven with power-driven hammers.

$$R_n (metric) = \frac{867E}{S+5} \times \frac{W + (CxM)}{W + M} \quad R_n (english) = \frac{10.5E}{S+0.2} \times \frac{W + (CxM)}{W + M}$$

WHERE:

R _n	=	Nominal Pile Bearing Resistance in Newtons (pounds).
W	=	Mass of the striking part of the hammer in kilograms (pounds).
H	=	Height of fall in millimeters (feet).

S	=	Average penetration in millimeters (inches) per blow for the last 10 or 20 blows, except in cases where the pile may be damaged by this number of blows.
M	=	Total mass of pile plus mass of the driving cap in kilograms (pounds).
C	=	0.1 for Timber, Concrete and shell type piles, 0.2 for Steel H piling

*The following definition is for Metric units. See English units below:

E	=	WHx0.00981 for single acting power-driven hammers. It is equal to the joules or newton-meters (joule = newton-meter) of energy per blow for each full stroke of either single acting or double acting hammers as given by the manufacturer's rating for the speed at which the hammer operates.
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*The following definition is for English units:

E	=	WH for single acting power-driven hammers. It is equal to the foot pounds of energy per blow for each full stroke of either single acting or double acting hammers as given by the manufacturer's rating for the speed at which the hammer operates.
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NOTES:

When provisions are not made available for field determination of the energy output on a power-driven hammer, such as measurement of the drop for single-acting hammers, or such as pressure gauges or determination of energy on the basis of the frequency of the blows (cycles per minute) for double-acting hammers, the manufacturer's rated energy shall be reduced by 25 percent. This reduction is not intended to apply when determining the required hammer size. Double-acting hammers, for the purpose of these requirements, will include all hammers for which a power source is utilized for acceleration of the down-stroke of the ram. The dynamic formula specified herein-before are applicable only when:

- (a) The hammer has a free fall.
- (b) The head of the pile is free from broomed or crushed fibre.
- (c) The penetration of the pile is at a reasonably uniform rate.
- (d) There is not noticeable bounce after the blow. When there is a noticeable bounce, twice the bounce height shall be deducted from H to determine the value of H in the formula.

the bounce height shall be deducted from H to determine the value of H in the formula.

B2. Pile Driving Analyzer (PDA) Used as Field Control Method

The nominal pile bearing resistance shall be determined using the pile driving analyzer and the Case Pile Wave Analysis Program (CAPWAP) in accordance with the following section, Dynamic Monitoring of Pile Driving. The WEAP bearing graph listed below under deliverables shall be used to determine the bearing resistances that are recorded on the pile driving report (attach a copy of the bearing graph to the report). For informational and comparison purposes, the bearing resistances shall also be computed using the Mn/DOT formula and recorded on the report.

SB-17.3 Dynamic Monitoring of Pile Driving

A. Description of Work

The Contractor shall provide all equipment and personnel necessary to perform dynamic pile testing of driven piles using a Pile Driving Analyzer (PDA). The work shall be performed in accordance with the requirements of ASTM 4945. The dynamic pile testing shall be performed on the initial driving and re-driving of the test piles as directed by the Engineer. Testing may also be required on additional piles as designated by the Engineer.

B. Pile Preparation and Wave Matching

The Contractor shall prepare each pile to be tested by attaching instrumentation to the piles except that for testing on initial driving of steel shell piles, the Contractor shall attach the instrumentation after the pile has been placed in the leads. In addition, the Contractor shall perform wave matching of the PDA data using the Case Pile Wave Analysis Program (CAPWAP). This work shall be performed by an engineer experienced in dynamic testing and CAPWAP analysis. The program shall be run on all piles dynamically tested, or as directed by the Engineer.

C. Wave Equation Analysis

Following the wave matching, the Contractor shall use the GRLWEAP program and CAPWAP data to produce a refined Wave Equation Analysis Program (WEAP) bearing graph and inspector's chart to be used as the basis for pile acceptance. The bearing graph shall be used to determine the foundation pile's nominal bearing resistance that is to be recorded on the pile driving report. The wave matching analysis and wave equation analysis shall be performed in a timely manner.

D. Deliverables

The Contractor shall provide the following items to the Engineer within the specified time intervals described herein:

1. Results from each dynamic test performed with the PDA and checked with the CAPWAP program. The results shall be in the form of a hard copy of columnar data produced with the PDAPLOT program. The data shall consist of blow counts, stresses in the pile, pile capacities, hammer energies and hammer strokes for each one foot (0.25 meter) depth increment. The results shall be provided in a timely manner. In addition, the Contractor shall provide expert advice regarding the analysis of the PDA and CAPWAP data.
2. A WEAP bearing graph and inspection chart showing blow count-versus-pile resistance and stroke-versus-blow count that will be used for determining the nominal bearing resistance of the foundation piles. The graph/charts shall be developed based on the results of the PDA and CAPWAP data. Both the maximum force and maximum transferred energy calculated by WEAP shall match within 10% of those calculated by the CAPWAP. The bearing graphs shall be delivered to the Engineer within two days after completion of driving the test piles at any single substructure unit. These graphs/charts shall also be documented in the appropriate reports listed below.
3. A brief report for the piles at each substructure tested including a summary of the PDA and CAPWAP results. In addition, the Contractor shall supply one or more 3.5 inch diskettes or CD containing all data for the piles tested for that substructure. The data shall be in the form of X01 (PDA file) and Q00 (PDAPLOT file) files and shall be properly labeled. These reports shall be sent to the Engineer no later than three working days after dynamic pile tests have been completed at any given substructure unit.
4. A PDA summary report which summarizes the findings from the PDA and the associated CAPWAP computer program and the developed GRLWEAP bearing graphs. This report shall be sent to the Engineer no later than one week following the completion of the dynamic pile tests, addressed separately.

E. Method of Measurement

When the Pile Driving Analyzer field control method is required by the contract, measurement will be by the number of piles on which the pile driving analysis is performed. Initial analysis and redrive analysis on an individual pile shall be counted as one pile analysis. The Department reserves the right to increase or decrease the number of piles which are required to be dynamically monitored.

When the Pile Driving Analyzer field control method is not required by the contract but is chosen at the Contractor's option, no measurement will be made of the analyses performed and all costs associated with the dynamic testing will be at the Contractor's expense. The use of the Pile Driving Analyzer in not required by this Contract.

SB-17.4 Substitution for Steel H-Piling Prohibited

Substitution of thick wall pipe for steel H-Piling will not be permitted on this Project.

SB-18 (2461) STRUCTURAL CONCRETE

The provisions of Mn/DOT 2461 are hereby modified as follows:

SB-18.1 CONCRETE MIX FOR MASS CONCRETE ELEMENTS

All concrete for mass concrete elements shall conform to the concrete mix specified in the Plans, including, but not limited to, slump, air content, and cement/voids ratio. The Contractor shall submit the concrete mix design along with compressive strength and permeability test results to the Engineer for approval prior to concrete placement. Flyash, if used, shall be Class F.

A. Specific Requirements

1. Mass concrete designed with a slow-curing mix may fall below the required strength test results at 28 days provided the full required compressive strength is reached by 56 days and the mass concrete elements are not subjected to superimposed loads before the full strength is reached. No individual strength test result shall be below 80% of the full required compressive strength at 28 days.
2. Cement complying with ASTM C150 Type II shall be used for all mass concrete applications.
3. The Contractor may propose coarse aggregate grading as defined in below in lieu of the requirements of provision 3137 provided that the maximum size aggregate does not exceed 3 inches (75 mm), or two-thirds the clear distance between reinforcement bars, whichever is less.

Grading Requirements for Coarse Aggregate
Percent by mass (weight) passing square opening sieves

Test Sieve Size. Square Mesh (mm)	Coarse 75 to 37.5 mm	Medium 37.7 to 19 mm	Fine 10 to 4.75 mm
100	100		
75	90-100		
50	20-55	100	
37.5	0-10	90-100	
25	0-5	20-45	100
19		1-10	90-100
9.5		0-5	30-55
4.75			0-5

B. Submittals

The Contractor shall submit the following to the Engineer for review prior to the beginning of laboratory tests for the mix designs.

1. The proportions of the various ingredients proposed for use, including the water/cement ratio and cement voids ratio.
2. The amounts and types of additives proposed for use and their purpose.
3. Samples of all ingredients

After completion of the laboratory testing specified herein and, at least, 15 working days prior to the first concrete pour the following material shall be submitted for approval:

1. Laboratory reports of the results of compressive strength tests of the design mixes, including the following:
 - a. Exact batch weights and properties of all ingredients used and all aggregate gradations.
 - b. Specimen identification, including mix designation.
 - c. Date and time of cylinder preparation.
 - d. Date and time cylinder specimen was tested.
 - e. Compressive strength of each cylinder specimen.
 - f. A graphic plot of age, from 0 to 60 days, vs. strength for each mix design.
 - g. Concrete temperature during placement, concrete curing temperature, and curing conditions.

C. Mix Design and Laboratory Testing

The Contractor shall determine the exact proportions of cement, fly ash, fine aggregate, coarse aggregate, water and admixtures.

Standard Cylinder Testing: A minimum of 12 test cylinders 150 mm x 300 mm shall be made of each proposed mix. Three cylinders shall be broken at 3, 7 and 28 days. Cylinders shall be made in accordance with AASHTO T126 and tested in accordance with AASHTO T22.

D. Inspection

1. Verification by the Engineer

The Engineer may conduct independent sampling and testing to evaluate compliance of Contractor mix design.

2. Inspection by the Contractor

The Contractor shall be responsible for the making and testing of cylinders to determine when the concrete forms may be stripped. Cylinders will be made at a minimum of the rate stated in the Schedule of Materials Control in sets of three. The strength will be considered satisfactory for stressing or stripping of forms if the strength of each break is equal to or greater than the specified strength, as given in the Plans, with no test below the minimum strength as determined by the requirements of Section 5.3 of ACI 318-99. The Contractor shall provide this information to the Mn/DOT.

E. Measurement and Payment.

Measurement and payment for the concrete mix used for the mass concrete elements shall be in accordance with Item No. 2401.501 "STRUCTURAL CONCRETE (3Y43) as originally shown in the Plans per cubic yard and the cost shall include all work and costs required to meet the additional mass concrete mix design

and placement requirements. No additional compensation for use of mass concrete elements will be granted to the Contractor if the Contractor submits a request to use mass concrete elements and placement procedures as allowed in the Plans.

SB-19 (2471) STRUCTURAL METALS

The provisions of Mn/DOT 2471 are modified and/or supplemented with the following:

Delete the fourth paragraph of 2471.3A2 and substitute the following:

The Contractor/Fabricator performing coating application must demonstrate qualification by obtaining the AISC Sophisticated Paint Endorsement (SPE), the SSPS QP Certification, or a Quality Control Plan (QCP) that is acceptable to the Engineer.

Add the following to the end of the second paragraph of 2471.3C:

The Engineer will audit suppliers with approved QCP's on a biannual or annual basis or as deemed necessary by the Engineer to determine if the QCP is being implemented. The Department will invoke its Corrective Action Process if the audit indicates non-conformance. Corrective action, up to and including the supplier hiring a third party Quality Control Inspector, may be required as a disciplinary step, at no cost to the Department. A copy of the Departments Corrective Action Process is available from the Engineer.

Add the following to 2471.3E1 as the first paragraph:

Steel plates and splice plates for major structural components shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile or compressive stresses.

Add the following to 2471.3F:

F1b Web-to-Flange Welds

For the purpose of this specification, a repair is defined as any area of the welded product not in compliance with the current edition of AASHTO AWS D1.5 Bridge Welding Code. Limit each individual web-to-flange weld repairs to 2 percent of the weld length and grinding web-to-flange weld repairs to 5 percent of the weld length. Exceeding these limits will result in revocation of the Welding Procedure Specification (WPS) used to perform the initial production welding.

Add the following as 2471.3G1:

G1 Fracture Critical Welder Qualifications

Fracture Critical Welder Qualifications shall be in accordance with AASHTO/AWS D1.5-Bridge Welding Code. Annual requalification shall be based upon acceptable radiographic test results of either a production groove weld or test plate. If a welder is requalified by test, a WPS written in accordance with the requirements of D1.5, shall be used and the test plate shall be as shown in Figure 5.24. The WPS shall be included in the Fabricators QCP.

Add the following to 2471.3N1:

Work that is not performed in accordance with the suppliers approved QCP shall be subject to rejection in accordance with 1512.

SB-20 CONTAINMENT AND DISPOSAL OF WASTE MATERIALS

The provisions of 1717 are supplemented as follows:

SB-20.1 Handling and Disposal of Waste Materials

The Contractor shall contain waste materials on site and provide for their transportation and disposal in accordance with Minnesota Pollution Control Agency (MPCA) regulation under Minnesota Rules 7045 and MN/DOT criteria. Waste materials, which include, but are not limited to, existing paint residue (paint chips), treated timber residue and scrap, etc. must be managed as a hazardous waste. Waste disposable Personnel Protection Equipment (PPE) must be treated as a hazardous waste unless the Contractor provides proof that the waste is nonhazardous. Owner responsibility for recording the Contractor's testing, waste transport and disposal processes are described in Mn/DOT's manual for "Removing Paint (Dry Abrasive Blasting) from Bridge Steel Structures" available on the Web at <http://www.dot.state.mn.us/environment> then select the word "Publications" from the menu in the left column.

The Contractor's operations shall be modified if any significant dust emissions are observed by the Engineer during the partial removal and salvage work.

SB-20.2 Storage of Materials

At all times during removal and salvage operations, the Contractor shall provide locked storage of regulated waste materials to prevent access by unauthorized persons.

SB-20.3 Loss of Paint and Treated Timber Materials Into Public Waters

In the event of accidental loss of paint chips and treated timber materials or debris into public waters, the Contractor shall take immediate action to recover the lost materials, and the incident shall be immediately reported by telephone to the State Duty Officer 1-800-422-0798 followed by a written report addressed to MPCA, Water Quality Division, Compliance and Enforcement Section, 520 Lafayette Road, St. Paul, Minnesota 55155.

SB-20.4 Waste Management and Disposal of Regulated Waste

A. Storage

The Contractor shall provide containers intended to hold regulated waste which meets the requirements in CFR 49, subp. 178.502. The containers must meet the requirements of the identification codes 1A2 (steel drum with removable head) or 1H2 (plastic drum with removable head.) The Contractor shall have the option to store blasting residue for transportation in roll-offs supplied by the Mn/DOT hazardous waste contractor.

B. Hazardous Wastes

The Contractor shall have all regulated waste transported and disposed of through the Mn/DOT hazardous waste contractor. Call 651.366.3630 for present hazardous waste contract and prices.

Subject to penalty under Mn/DOT 1807, *Failure to Complete the Work on Time*, no later than 30 days after any waste is transported off site, the Contractor shall provide the following information to the Project Engineer:

1. Type of waste shipped;
2. Quantity of waste shipped;
3. Date of waste shipment;
4. Name and address of transporter;
5. Name and location of disposal site;
6. Final signed copies of the hazardous waste manifest and Land Disposal Restriction (LDR) form.

SB-20.5 Handling and Disposal of Non-hazardous Residue

The Contractor shall notify the Project Engineer of each waste disposal site. Subject to penalty under Mn/DOT 1807, *Failure to Complete the Work on Time*, within 30 days of transportation of waste off site, the Contractor shall furnish to the Engineer records of disposal including, but not limited to, waste manifests which have been signed by the receiving approved landfill, scale tickets, invoices and any laboratory analysis.

Unless otherwise required in these special provisions, disposal of non-hazardous waste in a Mn/DOT approved landfill is acceptable.

Hauling and placement of non-hazardous waste in accordance with appropriate specifications for designated usage will be the responsibility of the Contractor.

SB-20.6 Method of Measurement
Collection, storage, and disposal of regulated waste material will not be measured.

SB-20.7 Basis of Payment

Payment for all work associated with collection, storage, and disposal of regulated waste material shall be included in the Contract per lump sum for Item No. 2104.601 "REMOVE REGULATED WASTE (BRIDGE)".

SB-21 (2478) ORGANIC ZINC-RICH PAINT SYSTEM

SB-21.1 Scope

This work shall consist of painting in accordance with provisions of 2478, the structural steel for Br. No.6961 as designated in the Plans.

Add the following definitions to 2478.1B:

- (17) Coating System: The surface preparation and application of specific coating classifications (i.e., Inorganic Zinc, Polyurethane, Acrylic, Polyurea, Latex, etc.) of coating products to provide a film forming a unified whole for the purpose of corrosion protection and/or aesthetics.
- (18) Paint System: A set of interacting film forming paint materials and products from a single manufacturer which combine to make up a complete coating system.

Delete the last sentence of 2478.1A and substitute the following:

This Specification applies to full system applications, in shop or field, of new construction and recoating of existing structures using an Organic Zinc-Rich Coating System.

Delete 2478.2B(1) and substitute the following:

- (1) Use only paint systems listed on the Department's "Approved/Qualified Product List for Bridge Products, "Bridge Structural Steel Coating", Three Coat Systems (Organic) (<http://www.dot.state.mn.us/products>). For products not on the Department's prequalified list, provide information as required on the web site.

Delete 2478.3A1 and substitute the following:

- (1) At least 30 days prior to starting work the Contractor must demonstrate qualification by submitting, for approval, a Quality Control Plan (QCP) to the Bridge Office, Bridge Construction and Maintenance Engineer. Write the QCP using AASHTO/NSBA S8.1-Guide Specification for Coating Systems with Inorganic Zinc-Rich Primer as a guide for its content.
- (2) Provide the Quality Assurance Inspector (QAI) or Engineer with evidence that painters, applicators, and Quality Control personnel have been trained by the paint manufacturer's technical representative on the application of the coating system being applied on the bridge project. Make the training documentation available to the Engineer upon request.

Add the following to the end of the first paragraph of 2478.3C:

The Engineer will audit suppliers with approved QCP's on a biannual or annual basis or as deemed necessary by the Engineer to determine if the QCP is being implemented. The Department will invoke its Corrective Action Process if the audit indicates non-conformance. Corrective action, up to and including the supplier hiring a third party Quality Control Inspector, may be required as a disciplinary step, at no cost to the Department. A copy of the Departments Corrective Action Process is available from the Engineer.

Delete the second paragraph of 2478.3C and substitute the following:

The QCP procedures shall include, at a minimum, but not be limited to, the following recorded measurements at the given minimum frequencies:

Delete 2478.3C(4)i and substitute the following:

- i. Coating system final evaluation and repair - visual, 100% of each element.

Add the following to the first paragraph of 2478.3F4:

The intermediate coat shall be as per 2478.2B(1) of this special provision:

Add the following to the first paragraph of 2478.3F5:

The finish coat shall be as per 2478.2B(1) of this special provision. The color shall be BLACK matching Federal Standard 595 B No. 27038 and have a semi-gloss finish.

SB-22 (2573) TEMPORARY ROCK CONSTRUCTION ENTRANCE

This work consists of furnishing, installing, maintaining, and removing temporary rock construction entrances as required by permit or as directed by the Engineer, with the purpose of reducing the amount of solids tracked by construction vehicles from the site to surfaces outside the site where runoff can carry the solids to stormwater discharge. This work shall be performed in accordance with the applicable Mn/DOT Standard Specifications and the following:

SB-22.1 General Requirements:

The temporary access work required for the bridge reinstallation and reconstruction work required for the bridge reinstallation and reconstruction work are summarized below:

1. Prepare temporary access road/s and/or furnish temporary access from the river to the site as required to conduct the partial bridge reinstallation and reconstruction work. This work shall include installation and construction of any temporary construction equipment platforms and/or, staging/work areas required to permit the bridge reconstruction work.

2. The Contractor shall maintain all existing barricades and traffic control installed in the previous Project in order to ensure security of the construction site.
3. Restore the temporary access road/s and/or any temporary access from the river to original existing conditions. The Contractor shall restore any areas still disturbed from the previous partial bridge span relocation and damaged west pier removal project work. Install turf establishment as required to restore the disturbed areas.
4. The Contractor shall remove, salvage, and deliver all barricades and temporary traffic control for the Project to the Owner in accordance with the Engineer's directions.
5. Dispose all debris generated from the temporary access work at locations approved by the Engineer and in accordance with SB-20.

SB-22.2 Materials

- (A) Rock, Class 1 Crushed Rock, Mn/DOT 3138.

SB-22.3 Construction Requirements

The minimum rock depth shall be 200 mm [8 inches].

The Contractor shall clean up the project site when work is complete to the satisfaction of the Engineer.

SB-22.4 Method of Measurement

Temporary Rock Construction Entrances will be measured by the each acceptably installed as specified.

SB-22.5 Basis of Payment

Payment will be made under Item No. 2573.602 "TEMPORARY ROCK CONSTRUCTION ENTRANCE" at the Contract bid price per each, which shall be compensation in full for all labor, materials, equipment, and other incidentals necessary to complete the work as specified, including the costs of maintenance and removal as required by the Contract. Work included in the per each pay item shall include: work required to prepare temporary access road/s and/or furnish temporary access from the river to the site as required to conduct the partial bridge reinstallation and reconstruction work; work required to install and construct any temporary construction equipment platforms and/or, staging/work areas required to permit the bridge reconstruction work.; work required to maintain all existing barricades and traffic control installed in the previous Project in order to ensure security of the construction site; work required to restore the temporary access road/s and/or any temporary access from the river to original existing conditions.; work required to restore areas still disturbed from the previous partial bridge span relocation and damaged south pier removal project work.; work required to install turf establishment as required to restore the disturbed areas.; and work required to remove, salvage, and deliver all barricades and temporary traffic control for the Project to the Owner. in accordance with the Engineer's directions.

Work associated with the collection, storage, and disposal of regulated waste material generated during the temporary access road installation work shall be included in the Contract per lump sum for Item No. 2401.601 "REMOVE REGULATED WASTE (BRIDGE)". Refer to Section SB-20.

SB-23 (3372) STEEL PILING

The provisions of 3372.2 shall apply except as modified below:

The first paragraph of 3372.2 is hereby deleted and the following substituted therefore:

Steel H-piles shall be bearing sections of the size and mass per unit of length specified in the Plans and shall conform to ASTM A572M/A572, Grade 345 (50) for carbon steel shapes of structural quality.

SB-24 (3385) ANCHOR RODS

The provisions of 3385 shall apply except as modified below:

Add the following to 3385.2:

Anchorage supplied under this specification must be pre approved by the Mn/DOT Laboratory and the certification from the Mn/DOT Laboratory must not be more than one year old. The Contractor must furnish the Engineer a copy of the Mn/DOT approval letter for the source, size and grade of anchorages specified in the plans and also a certification stating that anchor bolts of the size and grade specified were manufactured and tested in accordance with ASTM F 1554 (e.g. heat analysis and heat number, tensile tests, zinc coating weight and thickness, etc.).

SB-25 (3391) FASTENERS

Delete the contents of 3391.2B and substitute the following:

Field and shop bolts for steel bridges shall meet ASTM A325, Type 3 bolts. The bolts shall project through the nut not less than 3 mm (**1/8"**) nor more than 10 mm (**3/8"**). Field and shop nuts for steel bridges shall meet ASTM A563/A563M, Grade C3 or DH3 nuts and field and shop washers for steel bridges shall meet ASTM F436/F436M, Type 3 washers.

For all other bridges and structures the bolts shall meet ASTM A325, Type 1 (for painted and/or galvanized applications) or Type 3 (for unpainted weathering steel applications). The bolts shall project through the nut not less than 3 mm (**1/8"**) nor more than 10 mm (**3/8"**). The nuts shall meet ASTM A563/A563M and the washers shall meet ASTM F436/F436M.

ASTM A325 bolts may only be retightened once after having been previously fully tightened.

At the time of installation of fasteners, all nuts, regardless of their specified finish, shall be lubricated with a lubricant of contrasting color as per ASTM A 563 Supplementary requirements S1, S2, and S3.

SB-25.1 Delete the first two sentences of 3391.2E and add the following:

Stainless steel bolts are to meet the requirements of ASTM F 593, Condition CW1, Type 304, 316, or 316L, with a minimum yield strength of 415 MPa (60,000 psi), an ultimate tensile strength of 660 MPa (95,000 psi), and a minimum elongation of 20 percent in 50 mm (2 inches). The nuts are to meet the requirements of ASTM F 594, Condition CW1, Type 304, 316, or 316L.

SB-26 (3741) ELASTOMERIC BEARING PADS

The provisions of 3741 shall apply except as modified below:

Replace the first sentence in 3741.2A with the following:

The elastomeric portion of the bearing pads shall be in accordance with AASHTO M251 04 with a specified Shore A scale hardness of 60 ±5 durometers. The elastomer compounds shall be classified as of low-temperature Grade 4 as specified by the grade requirements of Table 14.7.5.2-2, "Low temperature Zones and Minimum Grade of Elastomer", of the AASHTO LRFD Bridge Design Specifications.

Delete all of 3741.2B1 except for the last paragraph.

Geotechnical Evaluation Report

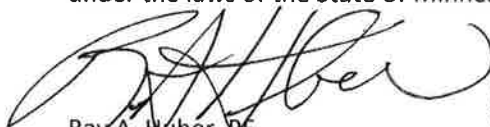
Red Jacket Trail Bridge
State Highway 66
Mankato, Minnesota

Prepared for

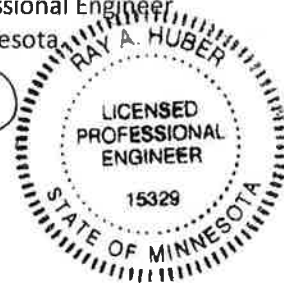
Blue Earth County Public Works

Professional Certification:

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Ray A. Huber, PE
Vice President-Principal Engineer
License Number: 15329
February 2, 2011



Project MA-10-10092

Braun Intertec Corporation

February 2, 2011

Project MA-10-10092

Mr. Alan Forsberg, PE
Blue Earth County Public Works
35 Map Dr
PO Box 3083
Mankato, MN 56001

Re: Geotechnical Evaluation and Foundation Investigation
Red Jacket Trail Bridge
State Highway 66
Mankato, Minnesota


Dear Mr. Forsberg:

We are pleased to present this Geotechnical Evaluation Report for the Red Jacket Trail Bridge Improvements. Detailed information and recommendations follow in the attached report.

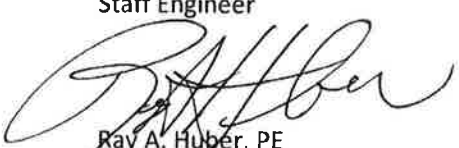
Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please call Philip Bailey at 507.995.8186 or Ray Huber at 952.995.2260.

Sincerely,

BRAUN INTERTEC CORPORATION



Philip E. Bailey, PE
Staff Engineer



Ray A. Huber, PE
Vice President – Principal Engineer

c: Mr. Jeff Johnson, SEH, Inc.

Geo Report – Red Jacket Trail Bridge

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Appendix

Boring Location Sketch
 Log of Boring Sheets
 Descriptive Terminology
 Parallel Seismic Report

A. Introduction

A.1. Purpose

The purpose of our services is to characterize subsurface geologic conditions at selected exploration locations and evaluate their impact on the design and construction of the proposed south bridge pier replacement. The purpose of the foundation investigation is to obtain information to potentially help understand the foundation design and limits.

A.2. Site History

We understand that the Red Jacket Trail Bridge was originally constructed in 1901. The bridge spans the Le Sueur River, with two sets of steel girders supported on three piers constructed of limestone and reinforced concrete. We understand that the support for the middle and south pier was provided by timber pile. The bridge was previously used as a train bridge; however, it has been used more recently as a pedestrian bridge for nearby Red Jacket Trail. In September of 2010, a major rainfall event resulted in flooding conditions on the Le Sueur River, which caused damage to the south pier due to erosion of the pier itself. The bridge was then closed as it was deemed unsafe until further investigation. It was determined by Blue Earth County Public Works department that the south pier would have to be repaired or replaced due to the damage. Upon removing the girders on the south span, the south pier collapsed, and its replacement is now necessary.

A.3. Scope of Services

Our scope of services for this project was originally submitted as a proposal to Mr. Alan Forsberg of the Blue Earth County Public Works department. We received authorization to proceed from Mr. Forsberg on December 17, 2010. Tasks completed in accordance with our authorized scope of services are described below. The nature of and factors contributing to deviations from our proposed scope of services are also noted.

Our scope of services was performed under the terms of our June 15, 2006, General Conditions.

A.3.a. Staking and Surveying

Surface elevations at the exploration locations were provided by the Blue Earth County Public Works Department.

A.3.b. Subsurface Exploration

We performed 1 penetration test boring at location ST-2 shown in the Appendix for the south pier on the east side of the timber trestle. The boring was extended to a depth of 25 1/2 feet. We performed 1 auger boring at the location of B-1 on the north side of the middle pier and extended it to a depth of about 27 1/2 feet at which depth we met refusal to advancement of the auger. Parallel seismic testing was performed on the middle pier boring location.

We observed the excavation of 1 test pit on the south side of the north pier. The test pit was excavated by Blue Earth County Public works, and was extended approximately to the bottom of foundation elevation.

Prior to commencing with our subsurface exploration activities, we cleared the exploration locations of underground utilities through Gopher State One Call.

A.3.c. Parallel Seismic Testing

We retained the services of 3D Geophysics for completion of a parallel seismic analysis for the center pier. The results of this analysis have been presented in a separate report titled "Parallel Seismic Report", which is attached to this report.

A.3.d. Geotechnical Evaluation, Analysis and Reporting

Information obtained from the boring was used to identify the geotechnical issues influencing design and construction, qualify the nature of their impact, and outline alternatives for their mitigation and to develop baseline recommendations for foundation design for the proposed pier replacement.

B. Results

B.1. Exploration Logs

B.1.a. Log of Boring Sheets

Log of Boring sheets for our penetration test boring and flight auger boring are included in the Appendix. The logs identify and describe the geologic materials that were penetrated, and present the results of penetration resistance tests, laboratory tests performed on penetration test samples retrieved from them, and groundwater measurements.

Strata boundaries were inferred from changes in the penetration test samples and the auger cuttings. Because sampling was not performed continuously, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may also occur as gradual rather than abrupt transitions.

B.1.b. Geologic Origins

Geologic origins assigned to the materials shown on the logs and referenced within this report were based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

B.2. Geologic Profile Boring ST-2

As revealed by the boring completed, the site is underlain with a variety of geologic materials including existing fill, alluvium and bedrock.

The boring initially encountered existing fill consisting of silty sand that was fine to medium grained mixed with dolomite and sandstone layers and extended to a depth of about 7 feet. The existing fill was wet and contained cobbles and gravel as well.

The existing fill was underlain by alluvial sands consisting generally of silty sand that was fine to medium grained, brown and wet to waterbearing. The alluvial sands were encountered to a depth of about 20 feet at which depth, bedrock was encountered. The bedrock encountered consisted mainly of sandstone of the Saint Lawrence or Jordan Formation. The sandstone is generally fine grained, poorly cemented and light gray to tan and white in color and waterbearing and extends to the borings termination depth of 25 1/2 feet.

B.2.a. Penetration Resistance Testing

Penetration resistance values recorded in the existing fill ranged from 8 to 13 blows per foot (BPF), indicating that its composition was somewhat variable. Penetration resistance values recorded in the alluvial sands ranged from 18 to 20 BPF, indicating that it was medium dense in relative density. The penetration resistance value of the sandstone was recorded to be 50 blows for 4 inches, indicating that it was very dense.

B.2.b. Groundwater

Groundwater was observed near the surface of (near elevation 776) of Boring B-1 during drilling, which was performed near the water level of the river. Boring ST-2 was performed along the existing railroad trestle near the top of the slope and encountered groundwater at a depth of about 12 1/2 feet (near elevation 774 1/2). The groundwater elevation appears to correspond to the water surface elevation of the Le Sueur River. We understand that the normal water elevation of the river ranges from elevations 772 to 776 and that the 100 year flood elevation is 788.

Seasonal and annual fluctuations of groundwater along with river, however, should be anticipated.

B.3. Test Pit Observation Results

Observations were performed during excavation of a test pit on the south side of the north pier. The test pit was excavated by personnel of the Blue Earth County Public Works department to a depth of about 2 feet below the bottom of the existing spread footing. Based on observations of the test pit, it appears that the existing north pier foundation is bearing on sandstone bedrock. The sandstone bedrock appeared similar in composition to that encountered in Boring ST-2 that was generally fine grained, poorly cemented and light gray to tan and white in color. Pictures taken during excavation of the test pit can be seen below in Figures 1 and 2.

Figure 1. Test Pit View (North and South)



Figure 2. Test Pit View (East and West)



B.4. Timber Trestle Coring

A total of 6 wood cores were taken of the existing exposed timber trestle near the ground surface. The cores were taken with an increment bore and were advanced to a depth of about 6 to 6 1/2 inches. Samples approximately 3/16 inch in diameter were then extracted from the increment bore barrel and measurements of the core length were taken. Core lengths measured indicated approximately 5 1/2 to 6 1/2 inches of recovery was obtained. Based on the cores obtained it appears that the timber treatment penetrated the exterior surface of the timber pile by about 1 1/4 to 3 inches. Based on the condition of the cores observed, it did not appear that any voids had been penetrated in the timber pile or that obvious rotting of the samples obtained was present.

B.5. Laboratory Test Results

Our mechanical analyses indicated that the alluvial sands tested contained sands tested to 14 to 19 percent silt and clay by weight.

C. South Pier Construction

C.1. Design Details

We understand that the proposed south pier will be constructed to appear similar to the north and middle piers. According to Mr. Jeff Johnson of SEH, Inc., the south pier will be constructed in the same location as the previous pier. The proposed pier is to have a bottom elevation near elevation 770, approximately 5 to 6 feet below the current water level. Due to the depth of the pier below the water elevation, sheet piling will be installed around the construction area to facilitate dewatering. In order to provide long-term scour protection, the sheet pile will be left in place permanently. We understand that a factored design load of 110 tons is to be used on HP12x53 pile.

C.1.a. Precautions Regarding Changed Information

We have attempted to describe our understanding of the proposed construction to the extent it was reported to us by others. Depending on the extent of available information, assumptions may have been made based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, we should be notified. New or changed information could require additional evaluation, analyses and/or recommendations.

C.2. Design Considerations

The geotechnical issues influencing design of the south pier appear to be limited. Due to the scour potential in the river channel and slope of the sandstone towards the river bottom, we recommend that the pier be supported on either driven pile or drilled piers. We understand that an HP 12x53 pile is the preferred pile. It should be noted that predrilling for the driven piles may be necessary to penetrate the sandstone surface and provided adequate scour protection if the sheet piling is does not remain in place.

C.3. Construction Considerations

From a construction perspective, the project team should also be aware that:

- In order to penetrate the very dense sandstone and provide additional scour protection it is our opinion that the pile should be advanced with a down-hole hammer or predrilled.
- In order to protect the pile from damage from driving to refusal on the sandstone, we recommend using a rock tip.

D. Recommendations

In accordance with our findings and discussions with Mr. Jeff Johnson of SEH, Inc, below are our recommendations for design of driven pile foundations.

D.1. Excavation Dewatering

In order to facilitate construction of the proposed pier, dewatering from within a cofferdam or sheetpiling may be required, depending on the water level of the river at the time of construction.

D.2. Driven Piles

D.2.a. Pile Type

At the request of Mr. Jeff Johnson of SEH, Inc., we evaluated design requirements for a driven HP 12x53 pile section.

D.2.b. Calculation Method

We used the computer program, DRIVEN, to estimate the nominal static geotechnical vertical compressive static capacities of the two pile types for the proposed bridge abutments. DRIVEN is a static pile analysis software program developed by the Federal Highway Administration.

We also used the computer program GRLWEAP, to simulate the pile/soil/hammer interaction, to better model the drivability and possibility of exceeding driving stresses prior to attaining the design bearing.

There are numerous methods of predicting the static capacities of piles based on the results of borings, and the results of the various methods often differ by a factor of two or more. Evaluating the ultimate capacity of a pile during or after installation also depends on the method selected. The measured capacity depends on the method used (dynamic formula, wave equation, Pile Dynamic Analyzer (PDA) or static load test) and the criteria used with each method.

D.2.c. Assumptions

We based the total unit weights input into DRIVEN on estimations of the measured moisture contents and past experience on other projects. We used the Naval Facilities Engineering Command, Soil Mechanics Design Manual (pg. 7.1-149, Figure 7) to estimate friction angles of coarse-grained soils. We modeled the sandstone as a cohesive material and estimated the undrained shear strengths of sandstone based on an average of the penetration resistances.

We understand the bottom-of-pile-cap (BOPC) elevation for the pier will be at elevation 770.

We assumed the pile cut-off elevations would be approximately 1 foot above the BOPC elevations.

D.2.d. Pile Capacities

Factored geotechnical pile capacities are determined by multiplying the pile driving resistance factor (Φ_{dynamic}) by the nominal pile resistance (R_n). The American Association of State Highway and Transportation Officials (AASHTO) and the Mn/DOT recommend relating Φ_{dynamic} to the degree of construction control. For situations where subsurface exploration and static calculations have been completed, Mn/DOT recommends the following Φ_{dynamic} factors.

Table 3. Recommended Pile Driving Resistance Factors^A

Specified Construction Control	Φ_{dynamic}
Mn/DOT LRFD Dynamic Formula ^B	0.40
Wave Equation	0.40
Wave Equation and Pile Driving Analyzer (PDA)	0.65

A Based on Table 10.5.5.2.3-1 of AASHTO's LRFD Bridge Design Specifications, 2007

B Based on Section 5-393-160-B of Mn/DOT's Bridge Construction Manual

We evaluated the necessary pile lengths to achieve the required geotechnical resistance for the Mn/DOT LRFD dynamic pile capacity formula and the wave equation with PDA methods of field control. For the Mn/DOT LRFD dynamic pile capacity formula method, we used a $\Phi_{dynamic}$ of 0.40 to estimate the desired R_n capacities ($R_n = \lambda Q_n / \Phi_{dynamic}$). We used a $\Phi_{dynamic}$ of 0.65 in our evaluation for the wave equation with PDA method. If a different construction control method is performed, the pile lengths or capacities may need to be revised.

The following table summarizes the anticipated pile lengths and tip elevations based on the factored load (λQ_n) of 110 tons (220 kips) and required nominal resistance (R_n) for the pier. Two capacities are provided: the first if the Mn/DOT LRFD dynamic pile capacity formula construction control method is used to control pile driving in the field, and the second if the wave equation with PDA construction control method is used. In order to tie the pile into the sloping sandstone, reduce the risk of a sliding failure and provide additional scour protection, we recommend the pile be advanced at least 5 feet into the intact, dense sandstone. The piles will likely be damaged if an attempt is made to drive the pile 5 feet into the sandstone. Provisions should therefore be made to advance the pile with a down-hole hammer or predrill the pile and grout them in place.

Table 4. Anticipated Pile Lengths, HP12x53 Piles

Boring	Top-of-Pile Elevation	Required Nominal Resistance, R_n (tons)	Estimated Pile Length*	Estimated Tip Elevation*
Mn/DOT LRFD Formula ($\Phi_{dynamic}$ of 0.4)	771	275	15	756
PDA ($\Phi_{dynamic}$ of 0.65)	771	170	15	756

*It should be noted that due to the downward slope of the sandstone surface toward the river channel, the pile lengths and tip elevations will likely vary.

D.2.e. Lateral Loading Analysis

Based on information provided by Mr. Jeff Johnson of SEH, Inc. and the subsurface exploration, we have performed a lateral analysis for the proposed south pier. We based our analysis on the following design information:

- Group analysis, with a pile group that is 3 x 7 (21 total), and spaced 4' center-center.
- 575 kip ice load acting at elevation 785 ,
- Bottom of footing at elevation 773,

- Resulting load acting on pile group consists of 575 kips shear and 6900 kip-feet moment,
- Pile group analyzed as free head,
- Load applied to strong axes of pile,
- Soil profile assumed to be similar to boring (scour not analyzed),
- Fifteen foot pile length

Based on the results of our analysis, we anticipate that pile deflection of less than 1/2 inch will occur. If this deflection is not acceptable, we should be notified. This analysis was based on loading parallel to the river current. It should be noted that at the time of this analysis, loading information was not available for lateral loading applied perpendicular to the river current (parallel to the bridge). The lateral capacity of the pile group parallel to the bridge will be less than the analyzed values due to the orientation of the pile group, the orientation of the piles within the group, and the slope of the river channel. When this information is available, we should be notified in order to perform the associated lateral analysis.

D.2.f. Pile Settlement

We anticipate total and differential deformation of the pile heads will be less than 1 inch under the assumed loads. Driven with the aforementioned design or construction control methods, driven pile is not designed to settle. The majority of deformation at the pile head is due to elastic shortening of the pile under the design loads.

D.2.g. Pile Specification and Driving

We anticipate the H-piles will conform to Mn/DOT Specification 2452 and 3372. In order to protect the pile from damage from driving to refusal on the sandstone, we recommend using a rock tip.

D.2.h. Pile Driving System

Using an under or oversized pile-driving hammer can be detrimental to the successful installation of piling. Prior to system acceptance, we therefore recommend performing a wave equation analysis modeling prospective contractors' pile installation systems. The wave equation analysis is used to estimate probable driving stresses and pile penetration resistance based on the type of hammer proposed, the specified pile type/size and the site-specific material conditions which, when combined, help evaluate system suitability. Our firm can discuss the requirements and limitations of wave equation analyses and, if needed, perform them.

D.3. Construction Quality Control

D.3.a. Excavation Observations

We recommend having a geotechnical engineer observe all excavations related to bridge pier construction. The purpose of the observations is to evaluate the competence of the geologic materials exposed in the excavations, and the adequacy of required excavation oversizing.

D.3.b. Materials Testing

We recommend density tests be taken in excavation backfill and additional required fill placed beside abutments/piers, and below pavements.

We also recommend slump, air content and strength tests of Portland cement concrete.

D.3.c. Pile Quality Control

We based the nominal resistance for the driven pile foundation system on our calculations using the soil conditions present at the boring location. In addition, tip stresses on the order of 35 to 40 ksi may be developed during driving. To more accurately predict actual pile lengths and capacities and reduce the risk of damaging pile during driving, we recommend performing a test pile program on at least 1 test pile at the bridge. We recommend dynamically monitoring this test pile in general accordance with ASTM International D 4945. Data accumulated from dynamic testing should be used to formulate a driving/length criterion by which the remainder of the pile should be driven. We provide this service and will gladly discuss it with you further.

We recommend having the remaining production piles driven under the continuous observation of a geotechnical engineer or a Mn/DOT -certified bridge inspector. Information noted for each production pile should include but may not be limited to driving criterion, pile length, tip elevation, driving resistance, splices and any observed damage.

After the piles have been driven to adequate bearing and have been cut off at design elevations, we recommend inspecting them for damage and plumbness/batter. Should the piles be damaged during driving, or should they be driven at an angle outside the plumbness or batter specifications, the geotechnical and structural engineers should review their load-carrying capabilities. We recommend including contingencies in the project budget for additional piles and/or longer piles in such cases.

D.3.d. Cold Weather Precautions

If site grading and construction is anticipated during cold weather, all snow and ice should be removed from cut and fill areas prior to additional grading. No fill should be placed on frozen subgrades. No frozen soils should be used as fill.

Concrete delivered to the site should meet the temperature requirements of ASTM C 94. Concrete should not be placed on frozen subgrades. Concrete should be protected from freezing until the necessary strength is attained. Frost should not be permitted to penetrate below footings.

E. Procedures

E.1. Penetration Test and Flight Auger Borings

The penetration test and flight auger borings were drilled with an off road-mounted core and auger drill equipped with hollow-stem auger. The borings were performed in accordance with ASTM D 1586. Penetration test samples were taken at 2 1/2- or 5-foot intervals. Actual sample intervals and corresponding depths are shown on the boring logs.

Boreholes that met the Minnesota Department of Health (MDH) Environmental Borehole criteria were sealed with an MDH-approved grout.

E.2. Material Classification and Testing

E.2.a. Visual and Manual Classification

The geologic materials encountered were visually and manually classified in accordance with ASTM Standard Practice D 2488. A chart explaining the classification system is attached. Samples were placed in jars or bags and returned to our facility for review and storage.

E.2.b. Laboratory Testing

The results of the laboratory tests performed on geologic material samples are noted on or follow the appropriate attached exploration logs. The tests were performed in accordance with ASTM or AASHTO procedures.

E.3. Groundwater Measurements

The drillers checked for groundwater as the penetration test borings were advanced, and again after auger withdrawal. The boreholes were then backfilled or allowed to remain open for an extended period of observation as noted on the boring logs.

F. Qualifications

F.1. Variations in Subsurface Conditions

F.1.a. Material Strata

Our evaluation, analyses and recommendations were developed from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth, and therefore strata boundaries and thicknesses must be inferred to some extent. Strata boundaries may also be gradual transitions, and can be expected to vary in depth, elevation and thickness away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until additional exploration work is completed, or construction commences. If any such variations are revealed, our recommendations should be re-evaluated. Such variations could increase construction costs, and a contingency should be provided to accommodate them.

F.1.b. Groundwater Levels

Groundwater measurements were made under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. It should be noted that the observation periods were relatively short, and groundwater can be expected to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

F.2. Continuity of Professional Responsibility

F.2.a. Plan Review

This report is based on a limited amount of information, and a number of assumptions were necessary to help us develop our recommendations. It is recommended that our firm review the geotechnical aspects of the designs and specifications, and evaluate whether the design is as expected, if any design changes have affected the validity of our recommendations, and if our recommendations have been correctly interpreted and implemented in the designs and specifications.

F.2.b. Construction Observations and Testing

It is recommended that we be retained to perform observations and tests during construction. This will allow correlation of the subsurface conditions encountered during construction with those encountered by the borings, and provide continuity of professional responsibility.

F.3. Use of Report

This report is for the exclusive use of the parties to which it has been addressed. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

F.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix

Braun Project MA-10-10092 Geotechnical Evaluation Red Jacket Trail Bridge Highway 66 Mankato, Minnesota					BORING: B-1 LOCATION: North of Center Pier		
DRILLER: M. Takada		METHOD: Power Auger		DATE: 12/28/10		SCALE: 1" = 4'	
Elev. feet 776.3	Depth feet 0.0	Symbol	Description of Materials (Soil- ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	Tests or Notes	
<div style="display: flex; justify-content: space-between;"> <div style="width: 15%;"> <p style="transform: rotate(-90deg); transform-origin: left top;">(See Descriptive Terminology sheet for explanation of abbreviations)</p> </div> <div style="width: 85%;"> <div style="border-bottom: 1px solid black; margin-bottom: 10px;"> <p>Overburden</p> </div> <div style="border-bottom: 1px solid black; margin-bottom: 10px;"> <p>Assumed Sandstone</p> </div> <p>END OF BORING - REFUSAL TO AUGER AT 27 1/2 FEET</p> <p>Water down 1 foot while drilling.</p> <p>3" Casing installed for Parallel Seismic Testing</p> </div> <div style="width: 15%; text-align: right;"> <p>▽</p> </div> </div>							
749.3	27.0						
748.8	27.5	SS					

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 10092.GPJ BRAUN.GDT 2/2/11 09:06

Braun Project MA-10-10092 Geotechnical Evaluation Red Jacket Trail Bridge Highway 66 Mankato, Minnesota					BORING: ST-2 LOCATION: Near South Pier (N 198110.059, E 557007.749),	
DRILLER: M. Takada		METHOD: 3 1/4" HSA, Autohammer		DATE: 12/29/10	SCALE: 1" = 4'	
Elev. feet	Depth feet	Symbol	Description of Materials (Soil- ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	Tests or Notes
787.7	0.0					
786.7	1.0	SM	SILTY SAND, fine- to medium-grained, brown, frozen.			
		FILL	FILL: Silty Sand, fine- to medium-grained, with Gravel and Cobbles, brown, wet.			
783.7	4.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, yellow, with Limestone Gravel, moist.	13		
780.7	7.0	SM	SILTY SAND, fine- to medium-grained, trace of Gravel, brown, wet to 12 1/2 feet then waterbearing, loose to medium dense. (Alluvium)	10		
				8		
				13		P200 = 19 %
				20	▽	P200 = 14 %
768.7	19.0	SM	SILTY SAND, fine- to medium-grained, brown, waterbearing, with lenses of white Clayey Sand and Gravel at 20 feet.	18		
766.7	21.0	SS	(Weathered Bedrock) JORDAN FORMATION, SANDSTONE, light gray to light brown, waterbearing, medium grained, poorly cemented, "Poorly Graded Sand".			
762.2	25.5		END OF BORING.	50/4"		
			Water down 15 feet while drilling.			
			Water down 15 feet with cave-in depth of 17 feet immediately after withdrawal of auger.			
			Boring then backfilled.			

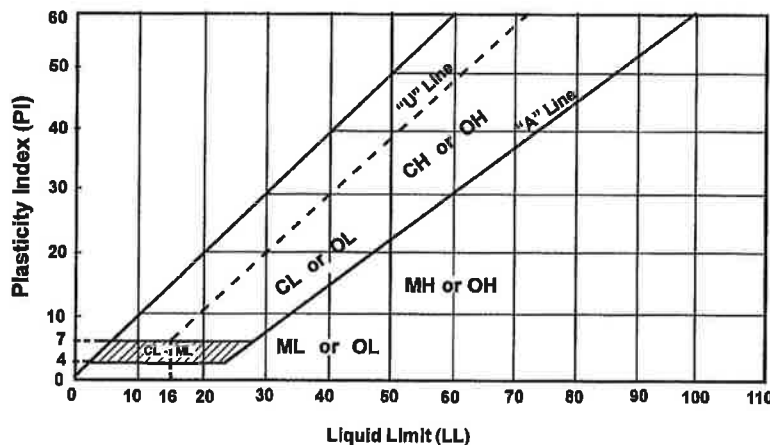
(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING 10092.GPJ BRAUN.GDT 2/2/11 09:06



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^a					Soils Classification	
					Group Symbol	Group Name ^b
Coarse-grained Soils more than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels 5% or less fines ^c	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^c	GW	Well-graded gravel ^d	
			$C_u < 4$ and/or $1 > C_c > 3$ ^c	GP	Poorly graded gravel ^d	
		Gravels with Fines More than 12% fines ^e	Fines classify as ML or MH	GM	Silty gravel ^{d f g}	
			Fines classify as CL or CH	GC	Clayey gravel ^{d f g}	
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands 5% or less fines ⁱ	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^c	SW	Well-graded sand ^h	
			$C_u < 6$ and/or $1 > C_c > 3$ ^c	SP	Poorly graded sand ^h	
		Sands with Fines More than 12% ⁱ	Fines classify as ML or MH	SM	Silty sand ^{f g h}	
			Fines classify as CL or CH	SC	Clayey sand ^{f g h}	
Fine-grained Soils 50% or more passed the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line ^j	CL	Lean clay ^{k l m}	
			PI < 4 or plots below "A" line ^j	ML	Silt ^{k l m}	
		Organic	Liquid limit - oven dried < 0.75	OL	Organic clay ^{k l m n}	
			Liquid limit - not dried < 0.75	OL	Organic silt ^{k l m o}	
	Silts and clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{k l m}	
			PI plots below "A" line	MH	Elastic silt ^{k l m}	
		Organic	Liquid limit - oven dried < 0.75	OH	Organic clay ^{k l m p}	
			Liquid limit - not dried < 0.75	OH	Organic silt ^{k l m q}	
Highly Organic Soils		Primarily organic matter, dark in color and organic odor		PT	Peat	

- a. Based on the material passing the 3-in (75mm) sieve.
b. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
c. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
d. If soil contains $\geq 15\%$ sand, add "with sand" to group name.
e. Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
f. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
g. If fines are organic, add "with organic fines" to group name.
h. If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
i. Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
j. If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
k. If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
l. If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
m. If soil contains $\geq 30\%$ plus No. 200 predominantly gravel, add "gravelly" to group name.
n. PI ≥ 4 and plots on or above "A" line.
o. PI < 4 or plots below "A" line.
p. PI plots on or above "A" line.
q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	S	Percent of saturation, %
MC	Natural moisture content, %	SG	Specific gravity
LL	Liquid limit, %	C	Cohesion, psf
PL	Plastic limit, %	ϕ	Angle of internal friction
PI	Plasticity index, %	qu	Unconfined compressive strength, psf
P200	% passing 200 sieve	qp	Pocket penetrometer strength, tsf

Particle Size Identification

Boulders	over 12"
Cobbles	3" to 12"
Gravel	
Coarse	3/4" to 3"
Fine	No. 4 to 3/4"
Sand	
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Silt	< No. 200, PI < 4 or below "A" line
Clay	< No. 200, PI ≥ 4 and on or above "A" line

Relative Density of Cohesionless Soils

Very loose	0 to 4 BPF
Loose	5 to 10 BPF
Medium dense	11 to 30 BPF
Dense	31 to 50 BPF
Very dense	over 50 BPF

Consistency of Cohesive Soils

Very soft	0 to 1 BPF
Soft	2 to 3 BPF
Rather soft	4 to 5 BPF
Medium	6 to 8 BPF
Rather stiff	9 to 12 BPF
Stiff	13 to 16 BPF
Very stiff	17 to 30 BPF
Hard	over 30 BPF

Drilling Notes

Standard penetration test borings were advanced by 3 1/4" or 6 1/4" ID hollow-stem augers unless noted otherwise. Jetting water was used to clean out auger prior to sampling only where indicated on logs. Standard penetration test borings are designated by the prefix "ST" (Split Tube). All samples were taken with the standard 2" OD split-tube sampler, except where noted.

Power auger borings were advanced by 4" or 6" diameter continuous-flight, solid-stem augers. Soil classifications and strata depths were inferred from disturbed samples augered to the surface and are, therefore, somewhat approximate. Power auger borings are designated by the prefix "B."

Hand auger borings were advanced manually with a 1 1/2" or 3 1/4" diameter auger and were limited to the depth from which the auger could be manually withdrawn. Hand auger borings are indicated by the prefix "H."

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they are reported in the following form: 2/12 for the second and third 6" increments, respectively.

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

TW indicates thin-walled (undisturbed) tube sample.

Note: All tests were run in general accordance with applicable ASTM standards.

Minnesota Department of Transportation Schedule of Materials Control – Introduction Page
(Federal Aid, State Funds, County/Municipal Federal Aid Projects and State Aid Projects)

This schedule outlines the minimum sampling and testing required for most materials used in highway construction. Some items that are rarely used or materials of recent development are often covered by special provisions and may not be shown on the schedule. For more information regarding contract requirements for testing, please reference the "Standard Specifications for Construction", Specification 1603 Materials: Specifications, Samples, Tests, and Acceptance.

Laboratories performing acceptance tests for payment shall be accredited by the AASHTO Materials Reference Laboratory (AMRL) or a comparable accreditation program approved by Mn/DOT and the FHWA for all test procedures performed.

When sample sizes required for testing exceed 35 pounds, please submit multiple containers of the material with no individual container weighing more than 35 pounds.

Small quantities of materials may be accepted without sampling and testing. A small quantity is defined as any total quantity, for the whole project, of one material, which is smaller than the minimum quantity required for testing unless modified by the individual material items. These materials shall be from known, reliable sources, perform satisfactorily and meet the requirements for purpose intended. The inspection report (Form 02415) should include a statement to this effect and show the source. Form 2403 may be used to report small quantities of diverse materials from different sources. Form 02415 and Form 2403 (or approved revisions) are referenced in the Schedule of Materials Control for project record documentation and are required to be maintained in the project file.

Where items of small quantity are used in a critical location or significantly influence the safety, performance, strength or durability of major construction items, prior approval for their use without testing must be obtained.

Previously approved materials transferred from another project should be reported on Form 02415. The report should include: type of material, quantities involved, source, and supplier of materials. Whenever possible, include the project number for which the material was originally approved.

If Forms 02415 and 2403 are referenced by form number within the Materials Control Schedule for materials or products received from pre-approved sources, where the field responsibility for acceptance is visual inspection and all information required to complete these forms is contained in other documents in the project file, the use of these forms becomes optional. If these forms are completed and sent to the Project Engineer by off-site inspection personnel from the district or the Office of Materials, they must be retained in the project file.

A telephone Index is included with the Schedule giving the numbers of contact persons if further information is required regarding the various materials. A form index is also included.

A website (www.dot.state.mn.us/materials.html) has been established for the Office of Materials. The contributing units to the Materials Control Schedule from the Pavement Engineering Section are the Bituminous Engineering Unit, the Concrete Engineering Unit, and from the Geotechnical Section, the Grading & Base Unit. The Department maintains the Approved/Qualified Products List and the Certified Products and Services List, as well as, the Schedule of Materials Control.

Products manufactured offsite may be pre-approved; however, final acceptance will be made at the point of incorporation, based upon review of documentation and inspection for shipping or other damage.

Contact the Mn/DOT District Independent Assurance Inspector when project starts to provide the proper servicing of your project.

Index

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XI. Electrical and Signal Construction Items	60 thru 62

Certifications List

Material	Section	Sub Section	Page	Certification Needed
All Granular Materials	I. Grading & Base	Many	7-11	Form 24346 and Test Results
Plant Mixed Asphalt (PMA)	II. Bituminous	Many	12-17	All PMA from certified supplier www.dot.state.mn.us/materials/bituminous.html
Shingles	II. Bituminous	2	13	Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.
Bituminous Material	II. Bituminous	9	16	Only Bituminous Materials from certified asphalt binder sources are allowed for use. The most current list of Certified Sources can at http://www.dot.state.mn.us/products
Emulsions	III. Seal Coat		19	Use Emulsion for seal coat from a certified asphalt emulsion source.
Emulsions	III. Seal Coat		19	Use Emulsion for Fog Seal from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		20	Use Asphalt Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		21	Use Micro surfacing Emulsion from a certified asphalt emulsion source.
Emulsions	III. Micro surfacing		22	Use Fog Seal Emulsion from a certified asphalt emulsion source.
Concrete Ready Mix	IV. Concrete	Many	23-37	Contact Report from Ready-Mix Plant. All concrete from certified plant including a computerized certificate of compliance with each load.
Ground Granulated Blast Furnace Slag Fly Ash Admixtures Cement	IV. Concrete		24	Concrete Plant Batching Materials: All materials must come from certified approved, or qualified sources. All certified sources must state so on the Bill of Lading Delivery invoice including Mn/DOT standardized certification statement for cement, flyash, and slag. The most current list of certified/approved sources can be found at www.dot.state.mn.us/products .

Material	Section	Sub Section	Page	Certification Needed
Air Content	IV. Concrete ready-mix for concrete paving		29	Certificate of Compliance.
Plastic for Curing	IV. Concrete		32	A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.
Aggregate for Low Slump Overlays	IV. Concrete		36	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Profiler	IV. Concrete		35	Contractor provides Mn/DOT certified Inertial Profiler Results for bumps/dips and/or Areas of Localized Roughness for the entire project.
Aggregate for Concrete Pavement Repair	IV. Concrete		37	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Aggregate for Dowel Bar Retrofits	IV. Concrete		38	Aggregate pit numbers and 1 passing gradation result per fraction each time aggregate is delivered to the site
Plant Stock & Landscape Materials	V: Landscaping etc.	2	39	Several certifications
Silt Fence	V: Landscaping etc.	5	40	Certificate of Compliance with MARV values
Flotation Silt Curtain	V: Landscaping etc.	6	40	Manufacturers' certification of compliance
Mulch Type 3	V: Landscaping etc.	12	40	Certified Vendor by Minnesota Crop Improvement Association must be tagged grain straw only on label.
Mulch Type 6 Wood Chips	V: Landscaping etc.	13	41	Emerald Ash Borer Compliance Agreement with the MDA
Seeds	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Seeds - Native	V: Landscaping etc.	14	41	Certified Vendor by Minnesota Crop Improvement Association must be tagged.
Sod	V: Landscaping etc.	15	41	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. A certificate of Compliance for all other types of sod listing grass varieties.
Compost	V: Landscaping etc.	16	41	A/QPL with certified test reports.
Waterproofing material membrane waterproof system	VI: Chemical Items		42	Certificate and test results
Waterborne latex traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Epoxy traffic paint	VI: Chemical Items		43	Certificate of Compliance
Traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Non-traffic marking paint	VI: Chemical Items		43	Certificate of Compliance
Bridge structural steel paint	VI: Chemical Items		44	Certificate of Compliance
Exterior masonry paint	VI: Chemical Items		44	Certificate of Compliance
Noise wall stain	VI: Chemical Items		44	Certificate of Compliance
Drop-on glass beads	VI: Chemical Items		44	Certificate of Compliance
Pavement marking tape	VI: Chemical Items		44	Certificate of Compliance
Steel sign posts	VII: Metallic	2	46	Certification of domestic source if applicable under 1601.
Posts for traffic or fence	VII: Metallic	3A	46	Certification of domestic source if applicable under 1601. For fence: fence certification form.
Fence components	VII: Metallic	3B	46	Fence certification form.
Fence gates	VII: Metallic	3C	46	Fence certification form.
Fence barbed wire fabric	VII: Metallic	3D	46	Fence certification form.
Fence woven wire fabric	VII: Metallic	3E	47	Fence certification form.

Material	Section	Sub Section	Page	Certification Needed
Fence chain link wire fabric	VII: Metallic	3F	47	Fence certification form.
Reinforcing steel uncoated bars	VII: Metallic	5A	47	Certificate of Compliance & certified mill analysis
Reinforcing steel epoxy bars	VII: Metallic	5B	48	Inspected tag or Certificate of Compliance & certified mill analysis
Steel Fabric	VII: Metallic	5E	48	Certificate of Compliance
Dowel Bars	VII: Metallic	5F	48	Certificate of Compliance
Pre or post tensioning strand	VII: Metallic	5G	49	Mill analysis
Anchor rods & Structural Fasteners	VII: Metallic	7	49	Yearly Mn/DOT passing test report
Timber & lumber	VIII: Miscellaneous	1	53	Certified on invoice
Elastomeric bearing pad	VIII: Miscellaneous	4	53	Certificate of Compliance
Corrugated metal pipe	IX: Geosynthetics & Pipe	1A	53	Certified on invoice
Corrugated metal structural plate	IX: Geosynthetics & Pipe	1B	53	Certified on invoice
Corrugated metal aluminum plate	IX: Geosynthetics & Pipe	1C	54	Fabricator's Certificate and guarantee
Concrete pipe & manholes reinforced	IX: Geosynthetics & Pipe	3A	54	Certified stamp and certification document
Concrete pipe non reinforced	IX: Geosynthetics & Pipe	3B	54	Certified stamp and certification document
Precast box culverts	IX: Geosynthetics & Pipe	4A	55	Stamped & field inspection report
Prestressed beams & posts, etc	IX: Geosynthetics & Pipe	4B	55	Stamped & field inspection report
Manholes & catch basins	IX: Geosynthetics & Pipe	5	56	Certification document or stamped
Thermoplastic pipe ABS & PVC	IX: Geosynthetics & Pipe	7	56	Certificate of Compliance
Corrugated PE Pipe: Single wall – edge drains	IX: Geosynthetics & Pipe	8	56	Certificate of Compliance
Corrugated PE Pipe: dual wall – 12"-48"	IX: Geosynthetics & Pipe	13	57	Certificate of Compliance
Geotextile fabric	IX: Geosynthetics & Pipe	14	58	Manufacturers' Certification of compliance
Brick sewer concrete	X: Brick, Stone, Masonry	1B	59	Air content statement
Concrete masonry units	X: Brick, Stone, Masonry	2A	59	Air content statement
Light standards	XI: Electrical & Signal	1	60	Certificate of Compliance
Cable & Conductors	XI: Electrical & Signal	7	61	Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If not received from Contractor, submit sample for testing along with manufacturers' material certification.
Electrical systems	XI: Electrical & Signal	10	62	Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.
Traffic signal systems	XI: Electrical & Signal	11	62	Traffic Signal Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report.

Telephone Index for Schedule of Materials Control

Section	Page	Section Name	Contact	Phone
Part I	Page 7	Grading & Base	Terry Beaudry Cary Efta Rebecca Embacher	(651) 366-5456 (651) 366-5421 (651) 366-5525
Website: www.dot.state.mn.us/materials/gradingandbase.html				
Part II	Page 12	Bituminous - Spec. 2360	John Garrity	(651) 366-5577
Part II B 4	Page 16	Asphalt Binder	Jim McGraw Jason Szondy	(651) 366-5548 (651) 366-5549
Website: www.dot.state.mn.us/materials/bituminous.html				
Part III	Page 18	Seal Coating – Spec 2356	Erland Lukanen Tom Wood	(651) 366-5460 (651) 366-5573
Part IV	Page 23	Concrete – Aggregates and Mix Design Concrete – Certified Ready Mix Concrete Paving Concrete – Bridges	Wendy Garr Wendy Garr Maria Masten Ron Mulvaney	(651) 366-5423 (651) 366-5423 (651) 366-5572 (651) 366-5575
Website: www.dot.state.mn.us/materials/concrete.html				
Part V	Page 39	Landscaping and Erosion Control Items Erosion Control Landscaping Wood Chips	Lori Belz Scott Bradley Tina Markeson	(651) 366-3607 (651) 366-4612 (651) 366-3619
Part VI	Page 42	Chemical Items	Jim McGraw Dave Iverson	(651) 366-5548 (651) 366-5550
Part VII	Page 45	Metallic Materials and Metal Products Sampling Test Results Bridge Structural Metals	Steve Grover Laboratory Todd Niemann Barry Glassman	(651) 366-5540 (651) 366-5560 (651) 366-4567 (651) 366-4568
Part VIII	Page 53	Miscellaneous Materials Sections 1 thru 3 Section 4 Test Results	Steve Grover Todd Niemann Barry Glassman Laboratory	(651) 366-5540 (651) 366-4567 (651) 366-4568 (651) 366-5560
Part IX	Page 53	Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete Sections 1 thru 11, & 13 Section 12 Section 14 Test Results	Steve Grover Rich Lamb Randy Tilseth Laboratory	(651) 366-5540 (651) 366-5595 (651) 366-5451 (651) 366-5560
Part X	Page 59	Brick, Stone and Masonry Units/Modular Retaining Wall Blocks Sections 1, 2A,3, & 4 Section 2B Test Results	Steve Grover Blake Nelson Laboratory	(651) 366-5540 (651) 366-5599 (651) 366-5561
Part XI	Page 60	Electrical & Signal Sections 1, 8-11 Section 2, 4- 7 Section 3 Test Results	Susan Zarling Steve Grover Wendy Garr Laboratory	(651) 234-7052 (651) 366-5540 (651) 366-5423 (651) 366-5560

Form Index

Grading and Base	
Form No.	Form Name
02115-03	Grading & Base Report
02154-02	Random Sampling Gradations
2170-02	Penetration Index Method - Aggregate Base & Edge Drains
02402-03	Work Sheet for Sieve Analysis of Granular Material
02463	Percent Crushing Report
24346-02	Certificate of Aggregates & Granular Materials
24587-01	Calculation for Moisture - Density Relationships in Subgrade Soils and Aggregate Base and Shoulders
Concrete	
Form No.	Form Name
2152	Concrete Batching Report
2162	Concrete Test Beam Data
2409	ID Card Concrete Test Cylinder
2448	Weekly Concrete Report
2449	Weekly Concrete Aggregate Report (QC/QA)
21412	Weekly Report of "Low Slump Concrete"
21763	Concrete Aggregate Worksheet
21764	Concrete Aggregate Worksheet JMF
24143	Weekly Certified Ready-Mix Plant Report (Verification)
24300	ID Card Cement Samples
24308	ID Card Fly Ash Samples
24327	Field Core Report
	Concrete W/C Ratio Calculation Worksheet
	Incentive/Disincentive Smoothness Worksheet
Bituminous	
Form No.	Form Name
2413	Asphalt Sample Identification Card
Miscellaneous	
Form No.	Form Name
2410	Sample ID Card
02415	Inspection Report on..... (May be used for documentation or use another method to capture required documentation)
2403	Inspection Report for Small Quantities (May be used for documentation or use another method to capture required documentation)
	Certification Form for Type of Fence used, see on right side of page, www.dot.state.mn.us/materials/lab.html

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (see note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2118 (b) 2211 (c) 2221	1. Gradation (a) Aggregate Surfacing (b) Aggregate Base (c) Aggregate Shoulders	3138 & Special Provisions	Production: 1/1,000 ton Placement: 1/5,000 ton	Random Sampling a) For less than 2,200 yd ³ (CV) use Individual Tests 1 test /550 yd ³ b) For more than 2,200 yd ³ (CV) use lots. Maximum lot size is 5,500 yd ³ (CV) Average 4 tests/Lot	60 lb	1 per source 30 lb	02115-03, 02154-02, & 24346-02
		3149 & Special Provisions					
		Special Provisions					
(e) 2211	(e) Open Graded Aggregate Base (OGAB)	Special Provisions	4 per source before placing on project	1/550 yd ³ (CV)		1 per source 30 lb	02115-03, 24346-02, & 02402-03
(f) 2105	(f) Granular Borrow Select Granular Borrow	3149 & Special Provisions	1/10,000 yd ³ (CV) (See Note 2)	1/20,000 yd ³ (CV) (See Note 2)		1 per source 30 lb (Salvage Bit. See Note 3)	
(g) 2331	(g) Full Depth Reclamation (FDR)	Special Provisions	1/6,000 yd ²	1/12,000 yd ²	None	None	02115-03 & 02402-03
(h) 2511	(h) Granular Filter	3601 & Special Provisions	1 per source before placing on project	1 per source (See Note 2)	300 lb	1 per source 150 lb	02115-03, 24346-02, & 02402-03

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(Continued)							
1. Gradation							
(i) 2451	(i) Granular Backfill	3149 & Special Provisions	2 per source before placing on project	1 per source (See Note 2)	60 lb	1 per source 30 lb	02115-03, 24346-02, & 02402-03
(j) 2451	(j) Aggregate Backfill					(Salvage Bit. See Note 3)	
(k) 2451	(k) Granular Bedding						
(l) 2451	(l) Aggregate Bedding						
(m) 2451	(m) Coarse Filter Aggregate	3149 & Special Provisions				1 per source 30 lb	
(n) 2502	(n) Fine Filter Aggregate						
(o) 2206	(o) Sand Cover						
2. Moisture – Density Test (Required for Specified Density) (Proctor)							
(a) 2211	(a) Aggregate Base	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1 per source	2005 Spec Book: 1/25,000 yd ³ (per source) 2011 Spec Book: none	50 lb	One sample minimum 25 lb	24587-01
(b) 2221	(b) Aggregate Shoulder						
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1 major soil type – See Note 6	2005 Spec Book: 1 per major soil type – See Note 6 2011 Spec Book: none		Two samples minimum 25 lb	
3. Relative Density Test (Required for Specified Density)							
(a) 2211	(a) Aggregate Base	2211 & Special Provisions	Contractor is encouraged to perform tests for process control.	1/1,000 yd ³ (CV)	None	None	02115-03 & 02140-03
(b) 2221	(b) Aggregate Shoulder						
(c) 2105	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions		1/4,000 yd ³ (CV)			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Quality Verification (Acceptance) Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221 (c) 2331 (d) 2502	4. Penetration Index Method (DCP) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	Contractor is encouraged to perform tests for process control.	1 DCP test/500 yd ³ (CV)	None	None	02115-03 & 02170-02
	(c) Full Depth Reclamation (FDR)	2331 & Special Provisions		1 DCP test/3,000 yd ²			
	(d) Fine Filter Aggregate (Edge Drains)			See Special Provisions			
	5. Modified Penetration Index Method (DCP) (Special Provisions) (a) Aggregate Base (b) Aggregate Shoulder (c) Granular Borrow Select Granular Borrow	2211 2221 2105, 3149, & Special Provisions		1 DCP test/500 yd ³ (CV) 1 DCP test/2,000 yd ³ (CV)			
(a) 2211 (b) 2221 (c) 2105	6. Relative Moisture (Required for Specified Density) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/1,000 yd ³	2005 Spec Book: 1 per 1/1,000 yd ³ or 10 tests whichever is less 2011 Spec Book: none	None	None	02115-03 & 21850-02
	(c) Embankment Soil (Excavation & Borrow)	2105 & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/10,000 yd ³	2005 Spec Book: 1 per 1/10,000 yd ³ 2011 Spec Book: none			

I. Grading and Base Construction Items (cont.)

Pay Item Number	Material	Spec. No.	Minimum Contractor Quality Control Testing Rate	Minimum Agency Verification (Acceptance) Testing Rate (See Note 1)	Minimum Field Sample Size	Minimum Companion (Lab) Sample Rate & Size (See Note 2)	Form No. (See Note 4)
(a) 2211 (b) 2221	7. Moisture Content, (Dry Weight) (Required for Quality Compaction, Penetration Index Method, & Modified Penetration Method) (a) Aggregate Base (b) Aggregate Shoulder	2211, 2221, & Special Provisions	2005 Spec Book: Contractor is encouraged to perform tests 2011 Spec Book: 1/1,000 yd ³	2005 Spec Book: 1 per 1/1,000 yd ³ or 10 tests whichever is less 2011 Spec Book: none	None	None	02115-03 & 21850-02
(a) 2105 2118 2211 2221	8. Percent Crushing (a) Belt Samples	3138, 3149, & Special Provisions	One Per Day	None			02463 & 24346-02
(b) 2105 2118 2211 2221	(b) Particle Count			One Per Source (See Note 7)			
2105 2118 2206 2211 2221 2451 2502	9. Aggregate (Quality Tests)	3138, 3149, & Special Provisions	1/source (See Note 5)	None	None	1 per source 30 lb (See Note 3)	None

I. Grading and Base Construction Items (cont.)

General Note: Sampling and Testing Procedures are found in the Grading and Base Manual in Section 5-692.200.

Note 1: Samples are not required for 500 ton or less. Report small quantities on form 02415 or 2403.

Note 2:

- a) Laboratory samples are not required for 1,000 tons or less.
- b) Include the laboratory companion with the first field sample..
- c) Include the field sample results with the laboratory sample.
- d) Laboratories with AMRL Accreditation are not required to submit laboratory companion samples.

Note 3: Carbonate aggregate materials require 50 lbs for the lab.

Note 4: Forms are available on the Grading & Base website at: <http://www.dot.state.mn.us/materials/gradingandbase.html>

Note 5: The Contractor may use the Ignition Oven (Mn/DOT Lab. Manual Method 1853) to determine bitumen content.

Note 6: Major soil types are defined in the Triaxial Chart located in the Grading and Base Manual.

II. Bituminous Construction Items for Specification 2360 (Note #1)(All bituminous mixtures are from Certified Plants) (www.dot.state.mn.us/materialsbituminous.html)**DEFINITIONS**

SAMPLE TYPE	DESCRIPTION	SAMPLE LOCATION DETERMINED BY	SAMPLE TAKEN BY	SAMPLE TESTED BY
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor Contractor (mixture) Agency (density cores)	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor <u>is required</u> to test this sample. The results <u>shall be used</u> as part of the QC program.	Agency	Agency	Contractor
IAST	The <u>I</u> ndependent <u>A</u> ssurance <u>S</u> ampling and <u>T</u> esting assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

A. Pre-Production Sampling and Testing for Specification 2360

SAMPLE SIZE: 35 kg (80 lb.) - plus #4 aggregate sample for quality testing and Percent Crushing
 15 kg (35 lb.) - minus #4 aggregate for quality testing
 35 kg (80 lb.) – RAP for Quality Testing
 5 kg (10 lb.) – RAS (Shingles) for Gradation and Quality Testing
 33 kg (75 lb.) - bituminous mixture plus 2 Gyratory specimens for volumetric testing
 35 kg (80lb.) - bituminous mixture for TSR testing (option A)
 8 kg (18 lb.) - bituminous mixture for TSR testing plus 6 Gyratory specimens (option B)
 1 kg (2 lb.) - for mineral filler.

1. Bituminous Mix Design (QC/QA)QC Testing

REMARKS: Mix Design for Spec. 2360 is Contractor's responsibility with review by Mn/DOT.

QA Testing

For Gyratory Design, Option 1- Laboratory Mix Design: In addition to reviewing the Trial Mix data (JMF), test Contractor's two Gyratory specimens and uncompacted mixture (specimens and mixture submitted at optimum asphalt content). Also, evaluate TSR per 2360.2E5a(3). For option 2, Modified Mix Design, review Trial Mix data only.

For Gyratory Design Option 2, Modified Mix Design, review Trial Mix data only.

II. Bituminous Construction for Specification 2360 (Part A, cont.)**2. Aggregate Quality Testing (QA Only)**QA Testing

Contractor shall provide 24 hour notice of intent to sample aggregates for quality testing. Agency has the option to monitor sampling.

Contractor submits to the Bituminous Engineer or the District Materials Engineer one (1) sample of each non-asphaltic aggregate type or class per source per year. Contractor shall also submit the asphaltic aggregate material when the mixture contains RAP or RAS.

Quality testing will be performed as directed by the Bituminous Engineer or the District Materials Engineer. When aggregate qualities approach specification limits or when material variation is observed, take additional field samples.

Contractor shall provide documentation that of all RAS /TOSS (Tear Off Shingle) material is from a MPCA certified supplier.

3. Mineral Filler (QA Only)QA Testing

One (1) per shipment of 45 metric tons (50 tons) or less, unless previously inspected.

4. Additives (QA Only)QA Testing

1 L (1 qt.) of blended asphalt binder and additive. Sample first shipment of each type of material, then submit one sample per 1,000 m³ (250,000 gal.) (approximately 1,000 ton).

B. BITUMINOUS PRODUCTION for Specification 2360

SAMPLE SIZE: 15 kg (35 lb.) for Aggregate for Gradation (QC/QA)

35 kg (75 lb.) for each plus #4 Aggregate Type for Quality Testing

15 kg (35 lb.) for each minus #4 Aggregate Type for Quality Testing

35 kg (75 lb.) for each RAP material for Quality Testing

5 kg (10 lb.) RAS (Shingles) for Processed Gradation and Quality Testing

30 kg (65 lb.) for Mixture Properties (QC/QA) 3 full 6" by 12" cylinder molds for QA (Gyratory mixes)

40 kg (90 lb.) for TSR (QC/QA) 4 full 6" by 12" cylinder molds for QA

40 kg (90 lb.) for Aggregate Specific Gravity (QC/QA)

1 L (1 qt) for Asphalt Binder (QA)

2 L (½ gal) for Asphalt Emulsion (QA)

1. Plant Mix Aggregate Gradation Testing (QC/QA, Verification*)QC Testing

1 per 450 metric tons (500 tons) at start of production, for the first 1,800 metric tons (2,000 tons) of mixture produced, then

1 per 900 metric tons (1,000 tons) or portion thereof per mix blend as required by 2360. 2G6

Companion samples taken for agency.

REMARKS: See Note #2, Note #3, & Note #5.

QA Testing

Companions to QC samples set aside for 10 calendar days & tested as needed. The Agency representative observes QC testing as needed.

2. Aggregate Percent Crushing (QC/QA, Verification*)QC Testing

Testing rates as required by 2360.2G6 CAA, 2360.2G6 FAA. Two tests per day (CAA, FAA) for first two days. If CAA results exceed the specification minimum by 8% of the requirement; sample daily, test minimum one per week. If FAA results exceed the specification minimum by 5% of the requirement; sample daily, test minimum one per week.

REMARKS: See Note #2, Note #3, & Note #4

QA Testing

Companions to QC samples set-aside for 10 calendar days and tested as needed. The Agency representative observes QC testing as needed.

3. Aggregate Quality Testing (QA Only)QA Testing

When aggregate qualities approach specification limits or when material variation is observed, take additional field samples as requested by Project Engineer.

When material variation is observed in RAP or RAS take additional field samples as requested by Project Engineer.

II. Bituminous Construction for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)****4. Asphalt Binder Content, % (QC/QA, Verification)**QC Testing

1 per 450 metric tons (500 tons) per mix blend for first 1,800 metric tons (2,000 tons) of mixture produced. Then 1 per 900 metric tons (1000 tons) or portion thereof per mix blend as required by 2360.2G6

REMARKS: See Note #5.

(a) Meter Method (Virgin only).....	Mn/DOT Bituminous Manual
(b) Incinerator Oven.....	Mn/DOT Lab Manual Method 1853
(c) Chemical Extraction.....	Mn/DOT Lab Manual Method 1851 or 1852
(d) Spot Check (Virgin only).....	Mn/DOT Bituminous Manual 5-693.848

REMARKS: The verification companion sample must use Method (b) or (c) only. When more than one Mn/DOT approved test procedure is available, the Contractor shall select one method at the beginning of the project (when material is submitted for Trial Mix Review) and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the Project.

REMARKS: See Note #2 & Note #3. If a member of a monitoring team observes the Contractor test, note and sign under remarks.

REMARKS: A computer file of the plant's control settings is required every 20 minutes for verifying the % add AC

QA Testing Companions to QC samples set aside for 10 calendar & tested as needed. The Agency representative observes QC testing as needed. The Agency will review the computer files of the plant's control settings.

5. Mixture Properties (QC/QA, Verification*)

Maximum Specific Gravity, Gyratory Bulk Specific Gravity - 2 Specimen Average, air voids, Adjusted Asphalt Film Thickness (AFT), asphalt binder content, gradation, and AC/Total AC ratio.

REMARKS: See Note #7 Asphalt Film Thickness (AFT)

QC Testing

1 per 450 metric tons (500 tons) per mix blend, at the start of production, for first 1,800 metric tons (2,000 tons) of mixture produced. Determine planned tonnage for each mixture to be produced during the production day. Divide the planned production by 1,000; round up to the next higher whole number. This number will be the number of production tests required for that mixture.

Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day.

REMARKS: See Note #2, Note #3, & Note #9.

QA Testing

Companion samples to QC samples set aside for 10 calendar days and tested as needed. The agency representative shall review QC operations on a daily basis. Review shall include but is not limited to monitoring QC summary sheets and comparing allowable tolerances for verification sample/verification companion sample test results. The Agency representative shall observe either 1 QC test per week (during production) or 1 QC test per 10,000 tons, whichever results in more frequent observations.

*Verification Testing

Verification Companion testing from Agency split sample is required to be performed and shall be used as a QC sample once per day. The verification companion shall also be tested for CAA and FAA at a rate of 1 test per week, if the CAA and FAA exceed the requirements by 8% and 5% respectively, otherwise test daily.

An Agency representative will take 1 verification sample per mixture blend per day for Mn/DOT laboratory testing. A verification companion sample will be given to contractor for QC testing.

II. Bituminous Construction for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)****6. Core Density and Thickness**QC TestingProduction/lot testing rate requirements.

Daily Production		Lots
Metric Ton	English (ton)	
270* – 545	(300* – 600)	1
546 – 910	(601 – 1000)	2
911 – 1455	(1001 – 1600)	3
1456 – 2359	(1601 – 2600)	4
2360 – 4173	(2601 – 4600)	5
4174+	(4601 +)	#

Add 1 lot/every 900 tons over 4601 tons (4174 metric tons)

*When mix production is less than 270 metric tons (300 tons), establish 1st lot when accumulative tonnage exceeds 270 metric tons (300 tons).

Core locations determined and marked by Agency. Companion cores are required for each Contractor density core. The Contractor shall schedule the approximate time of testing during normal project work hours so that the Agency may observe and record the saturated surface dry and immersed weight of the cores.

REMARKS: Sawing of cores into separate lifts is required. Contractor is required to have a saw capable of separating the core lifts without damaging the material. See Note #8 for Longitudinal joint density cores.

QA Testing

Core locations determined and marked by Agency. Agency representative observes all Contractor coring, measuring, sawing and testing, and takes possession of Agency cores after sawing. Agency cores shall be transported and tested at the Laboratory (Agency field or District/Division) as soon as possible to prevent damage due to improper handling or exposure to heat. A completed coring log shall be submitted to the Laboratory (Agency field or District/Division).

Remarks: See Note #6, Note #8, and Note #9

7. Aggregate Specific Gravity (QC/QA)

QC Sampling: Sampled and tested by Contractor, if requested by District Materials Engineer.

QA Testing: Companion sample to QC sample shall be submitted to the District Materials Lab and tested as needed.

8. Tensile Strength Ratio (T.S.R.) (QC/QA)QC Sampling

Sample as directed by the Engineer. If the Engineer requires the samples to be tested, both the Contractor and the Department will be required to test these samples within 72 hours after they are sampled.

QA Testing

When QC sampling is required, the companion sample to QC sample shall be submitted to the District/Division Materials Lab and tested as needed.

II. Bituminous Construction Items for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)****9. BITUMINOUS MATERIALS**

Only Bituminous Materials from Certified Sources are allowed for use. The most current list of Certified Sources can at <http://www.dot.state.mn.us/products>

SAMPLE SIZE: 1 L (1 qt) for Asphalt Binder (QA)/Cutback Asphalt (QA)

2 L (½ gal) for Asphalt Emulsion (QA)

Pay Item No.	Material	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2360	Asphalt Binder	3151.2A	QC testing is the responsibility of the bituminous material supplier. Random sampling is arranged by the Mn/DOT Chemical Laboratory.	State inspector observes contractor personnel taking sample. Sample first shipment of each grade of material at the start of a plant's production or after set-up of a portable plant. Thereafter, submit one sample per 1,000,000 liters (250,000 gal). Sample asphalt binder in clean one L (1 qt) steel container.	2413 Asphalt Sample Identification Card
2201 2355 2356 2357 2514	Asphalt Emulsion	3151.2C		Sample first shipment, then submit one sample per 200 m ³ ((50,000 gal.). Sample asphalt emulsion in clean two L (2 qt.) plastic container with wide screw top and send to Mn/DOT Chemical Lab within 7 days of sampling.	
2357 2358 2514	Cutback Asphalt	3151.2B		Cutback Asphalt should only be used in cold temperature applications with the Engineer's approval. Contact Bituminous Engineering Unit for cold temperature application guidelines. Pressure fit 1 L (1qt.) container for cutback asphalt.	

10. Moisture Content in Mixture (QC only)**QC Testing**

Sampling and testing shall be conducted by the Contractor on a daily basis unless exempted by the Engineer and tested according to the procedures in the Laboratory Manual 1855. Moisture contents above 0.3% are not allowed.

Note #1 Projects with bituminous tonnage less than or equal to 272 metric tons (300 tons) per day may be accepted on a small quantity basis at the discretion of the Engineer. Retain Form 02415 or Form 2403 in Project File.

II. Bituminous Construction for Specification 2360**B. Bituminous Production for Specification 2360 (cont.)**

Note #2 All QA test samples shall be from split samples.

If a member of the monitoring team observes the Contractor Test, note and sign under remarks.

The Project Engineer is responsible for:

- 1.) Reviewing control charts & Test summary sheets for accuracy and completeness,
- 2.) Checking sampling and testing procedures,
- 3.) Discussing QC problems with the Contractor,
- 4.) Obtaining Verification Samples,
- 5.) When additional testing is necessary, collect QA samples which have been acquired and retained by the Contractor and/or additional verification samples.

Note #3 For Mixture Quality Management, acceptance will be based on Contractor's test results as verified by Mn/DOT test results.

Note #4 Bituminous mixes composed entirely of Class A and/or Class B aggregates are not required to be tested for CAA (Coarse Aggregate Angularity).

Note #5 When the required sampling rate is one test per 500 tons, divide the bituminous mixture production planned for the day by 500, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 1000 tons, divide the bituminous mixture production planned for the day by 1000, and round up to the next higher whole number; this will be the number of tests required for the day. When the required sampling rate is one test per 2000 tons, divide the bituminous mixture production planned for the day by 2000, and round up to the next higher whole number; this will be the number of tests required for the day.

Note #6 The Department will select at least one of the two companion cores per lot to be tested for mat density. However, the Department may elect to test all companions to provide a direct verification of all individual and daily average test results. Agency representative observes all Contractor coring, sawing, measuring and testing, and takes possession of Mn/DOT cores after sawing. Agency cores shall be transported and tested at the Laboratory (Agency field or District/Division) as soon as possible to prevent damage due to improper handling or exposure to heat. A completed coring log shall be submitted to the Laboratory (Agency field or District/Division).

Note #7 Mn/DOT projects in the 2011 Construction season will require the calculated Adjusted Asphalt Film Thickness (AFT). VMA will still be calculated for informational purposes, but will not be used for acceptance criteria. The adjusted AFT shall be calculated each time a gradation test is required.

Note #8 When required, Longitudinal Joint (LJ) Density will be evaluated at random lots as determined by the engineer. Number of LJ lots for the day = number of lots calculated for mat density divided by .20 and rounding up to the next integer. Minimum of one LJ lot per day. For designated LJ lots the agency will test at least one of the mat density companion cores and at least one of the LJ companion cores.

Note #9 Random number generation and determination of random sample location shall be consistent with the Mn/DOT Bituminous Manual Section 5-693.7 Table A or Section 5 of ASTM D3665. The Engineer may approve alternate methods of random number generation.

III. Construction Items for the following Special Provisions**A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing****B. (2213) Permeable Asphalt Stabilized Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)****C. (2356) Ultra Thin Bonded Wearing Course (UTBWC)****D. (2357) Bituminous Tack Coat**

DEFINITIONS				
Sample Type	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
	<i>Definitions from 23 CFR 637.203</i>			
QA Quality Assurance	All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality			
QC Quality Control	All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.	Contractor	Contractor	Contractor
Verification sampling and testing	Sampling and testing performed to validate the quality of the product.	Agency	Agency	Agency
	<i>Mn/DOT Definition</i>			
IAST	The Independent Assurance Sampling and Testing assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

Should unique circumstances arise on a project which makes the quantities or rates of testing materials impractical, they may be revised prior to performing the work by contacting the Pavement Management Unit and obtaining their approval. The testing rates shown are only minimums.

III. Construction Items for Special Provisions (cont.)**A. (2356) Bituminous Seal Coat, Otta Seal, and Micro Surfacing****D. (2357) Bituminous Tack Coat (cont.)**

SAMPLE SIZE: Mix Design: 150 lbs.					
Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2356	Seal Coat Mix Design Gradation and Aggregate Qualities	2356	One per source Average gradation during production. % Shale Static Stripping Test Flakiness Index Los Angeles Rattler Aggregate design application rate. Bit. Material design application rate Loose unit mass (weight) of the aggregate Bulk specific gravity of the aggregate	Verify all QC results and review mix design.	
2356 Bit Seal Coat & Otta Seal	Seal Coat Aggregate Stockpile Production Gradation Construction	2356	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location. Sample for gradation. One per day. Test if required by the Engineer. All samples shall be taken from chip spreader hopper.	
2356 Bit Seal Coat & Otta Seal 2357	Seal Coat Emulsion Application rate Fog Seal Emulsion Application rate		Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered. Use a certified asphalt emulsion source. Verify the application rate daily by dividing the volume used by the area covered	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab. One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card 2413 Asphalt Sample ID Card

III. Seal Coat Construction Items for Special Provisions (cont.)**B. (2213) Permeable Asphalt Stabilized Stress Relief Course (PASSRC) and Permeable Asphalt Stabilized Base (PASB)**

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2213 PASSRC & PASB	Mix Design	2356 3139 3151	Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend. Submit 4 qts of required binder from a certified Supplier	Verify aggregate qualities and perform a mix design.	
2213 PASSRC & PASB	Production Mix	2356	Sample 35 lbs (15 kg) of blended aggregate from the belt. Test for gradation and CAA. Sample and test one per 500 ton (450 tonne) at the start of production for the first 2000 ton (1800 tonne). Then test one per day or one per 1000 ton (907 tonne), whichever is greater.	Verify gradation and CAA, once per day.	
	Asphalt Binder	3151	Asphalt spot check (min 1 per day) Sample first load. Submit sample in 1 qt (1 L) can. QC testing is the responsibility of the Material supplier.	Inspector observes contractor taking sample.	

C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Quality Assurance (QA)	Form No.
2356 UTBWC	Mix design	2356 3139 3151	Contractor create mix design and submit to Agency for review Submit 80 lbs of coarse and 30 lbs of fine aggregates for each JMF blend	Verify all QC results and review mix design.	
2356 UTBWC	Production mix	2356	Sample 55 lbs (25 kg) of mix from truck every 300 tons (270 tonne). Test for % AC, gradation, max gravity and adj AFT	Verify % AC, gradation, max gravity and adj AFT. Min once per day	
	Asphalt Binder	3151	Sample first shipment, then submit one sample per 250,000 gal. (1,000,000 liters). Submit sample in 1 qt (1 L) can.	Inspector observes contractor taking sample.	
	Polymer Modified Emulsion Membrane	3151	Sample first shipment, then one per 50,000 gal (200,000 liters). Submit sample in ½ gal (2 L) wide screw top container.	Inspector observes contractor taking sample.	

III. Seal Coat Construction Items for Special Provisions (cont.)**C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course**

SAMPLE SIZE: Mix Design: 150 lbs.					
Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
2356 Micro Surfacing	Mix Design	2356	One per source	Verify all QC results and review mix design.	
	Gradation and Aggregate Qualities		Average gradation during production. Sand Equivalent Abrasion Resistance Soundness		
	Asphalt Emulsion	3151	Certified asphalt emulsion source Residue after Distillation Softening Point Penetration at 25C (77F) Absolute Viscosity at 60C (140F)	Review test results submitted in the mix design format required in the special provision.	
Mix Design		Wet Stripping Wet Track Abrasion Loss - one hour soak - six day soak Saturated Abrasion Compatibility Mix Time at 25C (77F) Mix Time at 37.4C (100F)			
2356 Micro surfacing	Aggregate				
	Stockpile Production		Test for gradation. One per day, or one per 1360t (1500 tons), whichever is greater. If a temporary stockpile is used, test at this location.		
	Construction		Sample for gradation, sand equivalence and moisture content. One per 435.6 metric tons (500tons), minimum of one per day.	Test for gradation. One per 1360t (1500 tons), If a temporary stockpile is used, test at this location. Determine moisture content. One per day	

III. Seal Coat Construction Items for Special Provisions (cont.)**C. (2356) Seal Coat - Micro-surfacing, Ultra Thin Bonded Wearing Course**

Pay Item No.	Test Type	Spec. No.	Quality Control (QC)	Verification	Form No.
2213 2356 Micro surfacing	Emulsion		Use a Certified asphalt emulsion source.	Sample first shipment, then submit one sample per 200 m ³ (50,000 gal.). Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Quantity		Verify the quantity using equipment counter readings.		
	Fog Seal (when required)		Use a certified asphalt emulsion source.	One sample to test fog seal for dilution rate. Sample asphalt emulsion in plastic container with wide screw top and immediately send to Mn/DOT Chemical Lab.	2413 Asphalt Sample ID Card
	Application rate		Verify the application rate daily by dividing the volume used by the area covered.		

IV. Concrete Construction Items (www.dot.state.mn.us/materials/concrete.html)

The testing rates shown in this Schedule of Materials Control are minimums. All samples shall be taken in a random manner using an appropriate number generator. Take as many tests as necessary to ensure quality concrete.

If concrete quantities on the entire project total $< 100 \text{ m}^3$ (yd^3), Form 02415 or Form 2403 Inspection Report for Small Quantities may be used in lieu of the Weekly Concrete Report.

It is recommended that the Agency Plant Monitor be present during critical pours, such as superstructure or paving concrete (i.e. 3Y33, 3Y36, 3Y46, 3A21).

If any field test fails, reject the concrete or if the Producer makes adjustments to the load to meet requirements, record the adjustments on the Certificate of Compliance and the Weekly Concrete Report. Retest the load and record the adjusted test results. Make sure the next load is tested before it gets into the work.

If batching adjustments are made at the plant, test the adjusted load, before it gets into the work. Continue to test the concrete when test results are inconsistent or marginal.

The first load of concrete for any pour must have passing air content and slump results, prior to placing.

Material not meeting requirements shall not knowingly be placed in the work. If failing concrete inadvertently gets placed in the work, either the Mn/DOT Standard Specifications for Construction or the Schedule of Price Reductions for Concrete address penalties.

It is recommended that the Agency representative continually monitor the progress of all concrete pours in the field and review Certificates of Compliance. It is not a recommended practice to only perform minimum testing requirements and leave the pour.

Should circumstances arise on a project which makes the testing rate impractical, contact the Concrete Engineering Unit.

DEFINITIONS				
	Description	Sample Location Determined By	Sample Taken By	Sample Tested By
QC	Quality Control Testing performed by Contractor. Also known as Process Control Testing.	Contractor	Contractor	Contractor
QA	Quality Assurance Testing performed by the Agency. This test is performed on a companion sample to the Contractor's QC sample.	Contractor	Contractor	Agency
Verification	A sample to assure compliance of the Contractor's Quality Control program. The results shall be included as part of the QA Testing Program.	Agency	Agency	Agency
Verification Companion	A companion sample to the Agency's Verification sample provided to the Contractor. The Contractor <u>is required</u> to test this sample. The results shall be used as part of the QC program.	Agency	Agency	Contractor
IAST	The <u>I</u> ndependent <u>A</u> ssurance <u>S</u> ampling and <u>T</u> esting assures testers are sampling and testing properly and that equipment is calibrated correctly.	Agency	Contractor or Agency	Contractor or Agency

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Plant Batching Materials****Remarks:**

- (1) All materials must come from certified or qualified sources. All certified sources must state so on the delivery invoice.
 (2) The most current list of certified/approved sources can be found at www.dot.state.mn.us/products.

Sample Sizes:**Cementitious:** 2 kg (5 lb)**Admixture:** 0.25 L (1/2 pt) Producer obtains samples from dispensing tubes. Store samples in plastic container.**Water:** 3.5 L (1 gal) Store sample in a clean glass or plastic container.

Pay Item No.	Material	Spec. No.	Minimum Required Sampling Rate for Laboratory Testing	Form No.
2301	Portland Cement	3101	1 sample per project or 1 every 3 months, whichever is less.	24300 ID Card Cement Samples
2302	Slag	3102	The Producer obtains and stores the sample in a sealed container provided by the Agency, and includes the supplier's delivery invoice from which the sample is obtained.	
2401	Blended Cement	3103	Take additional samples as Concrete Engineer directs.	
2405	Fly Ash	3115		
2411	Admixtures (Accelerating, Retarding, Water-Reducing, Air-Entraining, etc.)	3113	For Concrete Paving: 1 sample of each shipment For Other Concrete: 1 sample per project or 1 every 3 months, whichever is less. The Producer obtains and stores the sample in a sealed container provided by the Agency.	2410 Sample ID Card
2412				
2422				
2452				
2461	Water	3906	1 sample from any questionable source	2410 Sample ID Card
2506				
2511				
2514				
2519				2410 Sample ID Card
2521				
2531				
2533				
2545				2410 Sample ID Card
2550				
2554				
2557				
2564				2410 Sample ID Card
2565				
2301	Alkali Silica Reactivity (ASR) Testing	2301	1 per paving project per sand source Write "Project Specific ASR Testing" on 2410 Sample ID card for the first sand quality and cementitious samples submitted.	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Certified Ready-Mix - Concrete Plant Production****Remarks:**

- (1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract.
- (2) All gradation and quality tests require companion samples. Samples taken at location identified on Contact Report located at plant.
- (3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:**Gradation Test:**

+19 mm (3/4" Plus) 10 (25 lb.)
 -19 mm (3/4" Minus) 5 kg (10 lb.)
 CA-70, CA-80 2.5 kg (5 lb.)
 Sand 500 g (1.1 lb.)

Moisture Test:

Coarse Aggregate 2000 g (4.4 lb.)
 Fine Aggregate 500 g (1.1 lb.)

Quality Sample Size for Lab Submittal:

+19 mm (3/4" Plus) 25 kg (50 lb.)
 -19 mm (3/4" Minus) 15 kg (30 lb.)
 Fine Aggregate 15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2302	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	2461	When over 20 m ³ (yd ³) of Agency concrete produced per day: Coarse: 1 per 100 m ³ (yd ³) Fine: 1 per 200 m ³ (yd ³) Passing aggregate gradations are required prior to the start of concrete production each day. Performing testing on representative material at the end of the most recent day of production is allowed. Washing the fine aggregate gradation (QC) sample is not required when the result on the -75µm (#200) sieve of the unwashed sample is less than 1.0%, Hold QA (QC companion) samples until they are picked up by the Agency monitor. Discard after 14 calendar days if not picked up.	None	21763 Concrete Aggregate Worksheet (QC/QA) 2449 Weekly Concrete Aggregate Report
2401		3126			
2405		3137			
2411					
2412					
2422					
2452					
2461					
2506					
2511					
2514					
2519					
2521					
2531					
2533					
2545					
2550					
2554					
2557					
2564					
2565					

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Certified Ready-Mix - Concrete Plant Production (cont.)					
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2302 2401 2405 2411 2412 2422 2452 2461 2506 2511 2514 2519	Gradation Testing (Verification/ Verification Companion) (5-694.145 and 5-694.148)	2461 3126 3137	Test the Verification Companion sample. Complete on the day the sample was taken. Wash all fine aggregate Verification Companion samples.	Coarse and Fine: 1 per day or 1 per 1000 m ³ (yd ³) whichever results in the lowest sampling rate. - 2 Verification samples per week when Agency production is 3 or more days per week. When ≤ 20 m ³ (yd ³) of Agency concrete is produced <u>per week</u> , Verification samples are not required. Identify verification samples with a "V" on the Sample ID Card and the verification companion sample. Include verification companion results.	2449 Weekly Concrete Aggregate Report 24143 Weekly Certified Ready-Mix Plant Report (Verification)
2521 2531 2533 2545 2550 2554 2557	Quality Testing <u>including</u> Coarse Aggregate Testing on -75µm (#200) (5-694.146)	3126 3137	Test at Contractor's Discretion	1 test each fraction per month Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
2564 2565	Aggregate Moisture Testing (QC) (5-694.142)	2461	When over 20 m³ (yd³) of Agency concrete produced per day: Coarse and Fine: 1 per 200 m ³ (yd ³) or completed every 4 hours, whichever results in the highest sampling rate. - Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. - If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed. In this event, the four-hour rate will commence with the first pour of the day, regardless if it is placed in Agency or private work.	None	2152 Concrete Batching Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Pavement - Concrete Plant Production****Remarks:**

- (1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract.
- (2) When incentives apply according to 2301:
 - a) Contractor QC Technician and Agency Plant Monitor are required to be present during the entire pour.
 - b) A certified ready-mix plant shall be **dedicated (provides concrete only to the concrete paving project)**.
- (3) All gradation samples shall be taken in the presence of the Agency, unless otherwise authorized by the Engineer. All gradation and quality tests require companion samples
- (4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:**Gradation Test:**

+19 mm (3/4" Plus) 10 (25 lb.)
 -19 mm (3/4" Minus) 5 kg (10 lb.)
 CA-70, CA-80 2.5 kg (5 lb.)
 Sand 500 g (1.1 lb.)

Moisture Test:

Coarse Aggregate 2000 g (4.4 lb.)
 Fine Aggregate 500 g (1.1 lb.)

Quality Sample Size for Lab Submittal:

+19 mm (3/4" Plus) 25 kg (50 lb.)
 -19 mm (3/4" Minus) 15 kg (30 lb.)
 Fine Aggregate 15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing		Agency Testing	Form No.
2301	Gradation Testing (QC/QA) (5-694.145 and 5-694.148)	3126 3137	<u>For a concrete paving batch plant:</u>	<u>For a certified ready-mix plant:</u>	Test the first 4 QA samples of production each time the Contractor mobilizes the plant or changes aggregate sources. 1 per day on randomly selected samples thereafter. Identify the gradation samples with “QA Gradation” on the Sample ID Card and include the JMF Number and the QC Gradation results.	21764 Concrete Aggregate Worksheet JMF Well-graded Concrete Aggregate Worksheet
			<u>When over 200 m³ (250 yd³) is produced per day:</u> 1 per 750 m ³ (1000 yd ³) or completed 1 per ½ day, whichever results in the highest sampling rate.	<u>When over 20 m³ (yd³) is produced per day:</u> 1 per 175 m ³ (250 yd ³) or completed every 4 hours, whichever results in the highest sampling rate.		
			Performing testing on representative material at the end of the most recent day of production is allowed. 5 per day maximum If well-graded aggregate incentives apply: Use the Contractor’s gradation results for well-graded aggregate incentive calculations as verified by Agency testing		If Coarse Aggregate Quality Incentive/Disincentives apply: The Agency may also use the QA gradation sample for the Coarse Aggregate Quality incentive/disincentive testing. In this case, notify the Producer/Contractor to double the QC/QA gradation sample size.	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production					
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2301	Coarse Aggregate Testing on -75 µm (#200) (QC/QA) (5-694.146)	3137	Test the first 4 samples of production each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question. 1 test per day thereafter	On the first day of production and each time the Contractor mobilizes the plant, changes aggregate sources, or the cleanliness of the coarse aggregate is in question: Test the first sample and then at least 1 of the next 3 samples. 1 test per week thereafter	21764 Concrete Aggregate Worksheet JMF
			<p>For a concrete paving batch plant:</p> <p>If w/c incentives do not apply: 1 per 750 m³ (1000 yd³) or completed every 4 hours, whichever results in the highest sampling rate.</p> <p>For a certified ready-mix plant:</p> <p>If w/c incentives do not apply: 1 per 175 m³ (250 yd³) or completed every 4 hours, whichever results in the highest sampling rate</p>	<p>For a concrete paving batch plant:</p> <p>If w/c incentives apply: 1 per 750 m³ (1000 yd³) or completed every 4 hours, whichever results in the highest sampling rate.</p> <p>Take initial samples for aggregate moisture testing within the first 175 m³ (250 yd³).</p> <p>Take initial samples for aggregate moisture testing within the first 75 m³ (100 yd³).</p>	
	Aggregate Moisture Testing (QC/Verification) (5-694.142)		Complete the initial moisture content and adjust the batch water prior to the start of concrete production each day. If weather conditions allow, performing moisture testing on representative material at the end of production the prior evening is allowed.	<p>If w/c incentives apply:</p> <p>Use aggregate moisture results for determining the water content to calculate the w/c ratio incentive/disincentive.</p> <p>Do not leave samples unattended.</p>	Concrete W/C Ratio Calculation Worksheet

Concrete Pavement - Concrete Plant Production

Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing	Form No.
2301	Water Content Verification Testing (Microwave Oven Verification) (5-694.532)		Sample the fresh concrete at the plant.	If w/c incentives apply: Microwave oven verification testing to verify the w/c ratio is completed in conjunction with Agency aggregate moisture testing.	Concrete W/C Ratio Calculation Worksheet
				Do not leave samples unattended.	
				For a concrete paving batch plant: Take initial sample for microwave oven verification testing within the first 175 m ³ (250 yd ³). At least one additional verification test should be taken if more than 750 m ³ (1000 yd ³) is produced in a day.	
				For a certified ready-mix plant: Take initial sample for microwave oven verification testing within the first 75 m ³ (100 yd ³). At least one additional verification test should be taken if more than 175 m ³ (250 yd ³) is produced in a day.	
	Unit Weight (QC) (5-694.542)		Test one load of concrete per day at the plant.	None	
	Air Content (QC) (5-694.541)	2461	Test the first load of concrete at the plant.	None	

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing
2301	Quality Testing including Coarse Aggregate Testing on -75 μ m (#200)	3126 3137	Test the -75 μ m (#200) on the Quality companion sample the day it was sampled. All other testing is at the Contractor's discretion	1 test each fraction every 17,500 m ³ (20,000 yd ³) of production. Split the Quality sample 4 ways: 1) Provide 2 quarters of the sample to the Producer/Contractor. 2) Test the -75 μ m (#200) on the quality sample at the <u>plant</u> the day it was sampled. 3) Submit the remaining sample to the lab for quality testing including testing on the -75 μ m (#200) sieve. Identify quality samples with a "Q" and record the QC and QA -75 μ m (#200) test results on the Sample ID Card. Identify the Quality Companion samples with a "Q" ..
				2410 Sample ID Card

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Pavement - Concrete Plant Production				
Pay Item No.	Test Type	Spec. No.	Producer/Contractor Testing	Agency Testing
2301	Coarse Aggregate Quality Testing for Incentive/Disincentive	3137	Test at Contractor's discretion	<p>If coarse aggregate quality incentives apply: Test the Class B aggregates for % absorption and Class C aggregates for % carbonate including any other tests necessary to make those determinations.</p> <p>Sample the 2 largest fractions in accordance with the following table and 2301:</p>
				Coarse Aggregate Quality Incentive/Disincentive Sampling Rates
				Plan Concrete m ³ [cubic yards]
				2,900 – 6,250 [3,500 – 7,500]
				6,251 – 8,500 [7,501 – 10,000]
				8,501 – 21,000 [10,001 – 25,000]
				21,001 – 42,000 [25,001 – 50,000]
				42,001+ [50,001+]
				Identify incentive samples on the Sample ID Card with "1/D."
				<p>2410 Sample ID Card</p> <p>Coarse Aggregate Quality Incentive/Disincentive Worksheet</p>

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)**Concrete Field Materials (Refer to Metallic Materials and Metal Products for sampling requirements for concrete reinforcement.)****Sample Sizes:****Joint Materials:**

Hot Poured Elastomeric:

5 kg (10 lb)

Take samples from application wand into 1 gallon steel container

Preformed Elastomeric: 2 m (6 ft)
Preformed: 0.25 m² (2 ft²)

Silicone Joint Sealer:

0.5 liter (1 pt)

Store sample in steel container.

Curing Materials:

Burlap:

1 m² (yd²)

Paper and Plastic:

0.25 m² (2 ft²)

Membrane Compound

1 liter (1 qt)

Materials must be thoroughly stirred or agitated immediately prior to taking sample. Store sample in steel container and cover immediately.

Pay Item No.	Material	Spec. No.	Minimum Required Field Sampling Rate	Form No.
2301 2302 2401 2411 2514 2521 2531	Preformed	3702	Visual Inspection	2410 Sample ID Card
2301 2302 2401	Preformed Elastomeric Type	3721	1 per lot	
	Silicone Joint Sealer	3722	Only joint materials from qualified sources are allowed. The most current lists can be found at www.dot.state.mn.us/products .	
	Hot Poured Elastomeric Type	3723 3725		
2301 2302 2401	Burlap	3751	Visual Inspection	
2411	Paper	3752	Visual Inspection - Must be white opaque	
2514 2520 2521	Membrane Curing Compound	3754 3754AMS 3755	Refer to the approved products list of curing compounds for pre-approved lots at http://www.mntrapps.dot.state.mn.us/CuringCompoundProducts/curingcompounds.aspx	
2531 2533	Plastic	3756	Visual Inspection - Must be white opaque	
			A Certificate of Compliance shall be submitted to the Project Engineer from the Manufacturer certifying that the plastic complies with AASHTO M171.	

Concrete Field Testing – Bridges and General Concrete

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2401	Air Content (Verification) (5-694.541)	2461	1 per 100 m ³ (yd ³) Test first load each day per mix Test when admixture adjustments are made to the mix.	2448 Weekly Concrete Report
2405				
2411				
2412				
2422	Slump (Verification) (5-694.531)	2461	1 per 100 m ³ (yd ³) Test first load each day per mix Test when admixture adjustments are made to the mix. No slump testing required for slipform placement	
2452				
2461				
2506				
2511	Concrete Temperature (Verification) (5-694.550)	2461	Record temperature each time air content, slump, or strength test specimen is performed/fabricated.	
2514				
2520				
2521				
2531	Compressive Strength (Verification) (5-694.511)	2461	1 cylinder per 100 m ³ (yd ³) 1 cylinder per day for sidewalk and curb and gutter A set of 3 cylinders shall be made when control cylinders are needed. Mn/DOT standard cylinder mold size is 100 x 200 mm (4 x 8 inch). If aggregate has a maximum size greater than 31.5 mm (1-1/4 inch), use 150 x 300 mm (6 x 12 inch) molds.	2409 ID Card Concrete Test Cylinder
2545				
2550				
2554				
2557				
2564				
2565				

Concrete Field Testing – Cellular Concrete

Pay Item No.	Test Type	Spec. No.	Agency Testing	Form No.
2519	Compressive Strength (Verification) (5-694.511)	2461 2519	1 set of 4 cylinders per day 100 x 200 mm (4 x 8 inch) cylinders shall be filled in two equal lifts, do not rod the concrete, lightly tap the sides, cover and move to area with minimal or no vibration. Do not disturb for 24 hours.	2409 ID Card Concrete Test Cylinder

Concrete Field Testing – Concrete Pavement					
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2301	Air Content Before Consolidation (QC/QA) (5-694.541)	2461	1 per 300 m ³ (300 yd ³) or 1 per hour, whichever is less Test first load each day per mix	1 air test per day	2448 Weekly Concrete Report
	Air Content After Consolidation (QC/QA) (5-694.541)	2461	Test 1 air content per ½ day of slip form paving to establish an air loss correction factor (ACF). See Special Provisions for additional information.	1 air test per day	
	Slump (QC/QA) (5-694.531)	2461	For fixed form placement: 1 per 300 m ³ (300 yd ³) and as directed by the Engineer Test first load each day per mix For slipform placement: No slump testing is required	For fixed form placement: 1 slump test per day For slipform placement: No slump testing is required	
	Concrete Temperature (QC/QA) (5-694.550)	2461	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Contractor.	Record temperature each time air content, slump or strength test specimen is performed/fabricated by the Agency.	2162 Concrete Test Beam Data
	Flexural Strength (QC) (5-694.521)	2301	1 beam (28-day) per day - Make additional control beams as necessary. - Control beams shall be made <u>within the last hour</u> of concrete poured each day. Fabricate beams, deliver beams to curing site, and clean beam boxes.	Supply beam boxes, cure, and test beams.	
	Concrete Pavement Texture (QC)	2301	1 per 1000 linear feet per lane of concrete pavement at locations determined by the Agency. All adjoining lanes shall be tested at the same location if paved at the same time. The Contractor supplies all materials necessary to perform the required testing.	Determine texture testing locations using random numbers.	Concrete Texture Worksheet
	Thickness (QC/Verification)	2301	The Contractor drills concrete cores at locations determined by the Agency. The Contractor probes the plastic concrete at locations determined by the Agency.	Determine probing and coring locations using random numbers. Initial pavement at core locations and re-initial the sides of specimens after coring to clearly verify their authenticity.	24327 Field Core Report Probing and Coring Report

IV. Concrete Construction Items (cont.) (www.dot.state.mn.us/materials/concrete.html)

Concrete Field Testing – Concrete Pavement					
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2301	Surface Smoothness	2301	Contractor provides Mn/DOT certified inertial profiler results for bumps/dips and/or Areas of Localized Roughness for the entire project as required by the Contract.	None	Concrete Profile Summary Worksheet

Concrete Field Testing - Low Slump Concrete for Bridge Deck Overlays

Remarks:

- (1) Mix design is provided by Mn/DOT on the back of the Form 21412 Weekly Report of "Low Slump Concrete" unless otherwise specified in the Contract.
- (2) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
- (3) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:

CA-70	2.5 kg (5 lb.)
Sand	500 g (1.1 lb)

Quality Sample Size for Lab Submittal:

Coarse Aggregate	25 kg (50 lb.)
Fine Aggregate	15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2404	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148))	3126 3137	<p>Prior to concrete production, the Contractor shall provide the Agency with:</p> <ul style="list-style-type: none"> Aggregate pit numbers 1 passing gradation result per fraction each time aggregate is delivered to the site. <p>No quality test results are required.</p> <p>Test companion samples at Contractor's discretion.</p>	<p>1 per fraction prior to concrete production and each time aggregate is delivered to the site.</p> <p>Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.</p>	<p>2410 Sample ID Card</p> <p>21412 Weekly Report of "Low Slump Concrete"</p>
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day	
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day For concrete from a concrete-mobile, allow mix to hydrate 4 to 5 minutes before slump test to assure all cement is saturated.	
	Compressive Strength (Verification) (5-694.511)	2461	None	1 cylinder per 30 m ³ (yd ³)	2409 ID Card Concrete Test Cylinder

Concrete Field Testing – Concrete Pavement Repair (CPR)**Remarks:**

- (1) Mix design is provided by Mn/DOT unless otherwise specified in the Contract.
- (2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.)
- (3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
- (4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:**Gradation Test:**

–19 mm (3/4" Minus)

5 kg (10 lb.)

CA-70, CA-80

2.5 kg (5 lb.)

Sand 500 g (1.1 lb.)**Quality Sample Size for Lab Submittal:**

Coarse Aggregate

25 kg (50 lb.)

Fine Aggregate

15 kg (30 lb.)

Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	Form No.
2302	Gradation and Quality Testing including Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: <ul style="list-style-type: none"> Aggregate pit numbers 1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a "Q" on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Air Content (Verification) (5-694.541)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day.	2448 Weekly Concrete Report
	Slump (Verification) (5-694.531)	2461	None	1 per 15 m ³ (yd ³) Test at beginning of pour each day. Allow mix to hydrate 4 to 5 minutes before slump test to assure all cement is saturated.	
	Compressive Strength (Verification) (5-694.511)	2461	None	1 cylinder per 30 m ³ (yd ³)	2409 ID Card Concrete Test Cylinder

[us/materials/concrete.html](#))

Concrete Field Testing –Dowel Bar Retrofit (DBR)

Remarks:

- (1) Mix Design is Contractor's responsibility with review by Mn/DOT unless otherwise specified in the Contract.
- (2) Testing rates apply to concrete that is produced on site. (Not from a certified ready-mix plant.)
- (3) All field gradation samples shall be taken by the Agency. All gradation and quality tests require companion samples.
- (4) Perform Quality testing as directed by the Concrete Engineer.

Minimum Sample Sizes:

Gradation Test:

CA-80 Sand	2.5 kg (5 lb.) 500 g (1.1 lb)	Coarse Aggregate Fine Aggregate		25 kg (50 lb.) 15 kg (30 lb.)	Form No.
Pay Item No.	Test Type	Spec. No.	Contractor Testing	Agency Testing	
2302	Gradation and Quality Testing <u>including</u> Coarse Aggregate Testing on -75µm (#200) (QC/Verification) (5-694.145, 5-694.146) and 5-694.148)	3126 3137	Prior to concrete production, the Contractor shall provide the Agency with: <ul style="list-style-type: none">Aggregate pit numbers1 passing gradation result per fraction each time aggregate is delivered to the site. No quality test results are required. Test companion samples at Contractor's discretion.	1 per fraction prior to concrete production and each time aggregate is delivered to the site. Identify quality samples with a “Q” on the Sample ID Card and the Quality companion sample.	2410 Sample ID Card
	Dowel Bar Retrofit Material Compressive Strength (Verification) (5-694.511)	2301 2302	None	During the pre-production test operations: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day Testing may need to be repeated if any problems with the dowel bar retrofit material are encountered. First day of production: 1 set of 3 cylinders tested at 3 hours 1 set of 3 cylinders tested at 1 day After the first day of production: 1 cylinder per day during production tested at rate determined by Engineer.	2409 ID Card Concrete Test Cylinder

V. Landscaping and Erosion Control Items

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105 2571 2575	1. Manufactured Topsoil borrow ^a Salvaged Topsoil (stockpiled)	3877.2	None	From each source: One composite sample for the first 765 m ³ (1,000 Cu yd) or less. One composite sample for each additional 2,300 m ³ (3,000 Cu yd) or fraction thereof.	10 kg (20 lb.)	^a Test results showing meets specifications.. Testing for all topsoil for fertility send directly to University of Minnesota soils lab from project. Testing takes about four weeks after delivery of the sample to the Department Laboratory. Sampling shall be done once source is identified or existing topsoil is stockpiled.
2571 2575 2577	2. Plant Stock & Landscape Materials ^b	3861 and 2571.2A1	Field Inspection at Job Site, submit itemized report for each shipment ^c .			^b Preliminary inspection will not be done at the source. Material must be in accordance with the Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects. ^c Utilize "Inspection and Contract Administration Guidelines for Mn/DOT Landscape Projects" to determine and measure minimum and maximum criteria thresholds. The following documentation must be provided: 1. A Mn/DOT Certificate of Compliance for Plant Stock, Landscape Materials, and Equipment 2. A valid copy of a nursery stock (dealer or grower) certificate registered with the MN Dept. of Agric. And/ or a current nursery certificate/license from a state or provincial Dept. of Agric. for each plant stock supplier. 3. A copy of the most recent Certificate of Nursery Inspection for each plant stock supplier. 4. Plant material shipped from out-of-state nursery vendors subject to pest quarantines must be accompanied by documentation certifying all plants shipped are free of regulated pests. 5. Bills of lading (shipping documents) for all materials delivered. 6. Invoices for all materials to be used. 7. Each bundle, bale, or individual plant must be legibly and securely labeled with the name and size of each species or variety.
2502 2573 2575 2577	3. Erosion Control Blanket ^d	3885	Visual Inspection	Random - See Footnote ^d	1 m ² (1 Sq yd)	^d Check Web site for list of approved products.. www.dot.state.mn.us/products

V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2573 2577	4. Erosion Control Netting ^e	3885	Visual Inspection	Random - See Footnote ^e	1 m ² (1 Sq yd)	^e Check Web site for list of approved products. www.dot.state.mn.us/products
2573	5. Silt Fence ^f	3886	Check Product Label. Obtain Certificate of Compliance with MARV values	For amounts 600m (2000 ft) or greater.	3 m (9 ft)	^f Samples sent 21 days prior to use. Check Approved/Qualified Products List (A/QPL) of accepted geotextiles.
2573	6. Flotation Silt Curtain ^g	3887	Visual Inspection			^g Accepted, based on manufacturers' certification of compliance. Check weight of fabric.
2573 2575	7. Erosion Stabilization Mat ^h	3885	Visual Inspection	See Footnote ^h	1 m ² (1 Sq yd)	^h Check Web site for list of approved products. www.dot.state.mn.us/products
2573	8. Filter Logs	3897	Visual Inspection	None		
2573	9. Flocculants ⁱ	3898	Visual Inspection	None		ⁱ Certificate of Compliance and MSDS to the Engineer.
2571 2575	10. Fertilizer ^j	3881	Visual Inspection			^j Bagged: Inspected on the basis of guaranteed analysis. Rate based on fertility analysis of slope dressing/topsoil. Bulk: Inspector to obtain copy of invoice of blended material stating analysis. Check the type specified.
2571 2575	11. Agricultural Lime ^k	3879	One gradation test for each 180 Metric Ton (200 ton)			^k Contractor must supply amount of ENP (Equivalent Neutralizing Power) for each shipment.
2575 2577	12. Mulch Material A. Type 3 Mulch - Certified Weed Free (Certified sources only) ^l	3882	Visual Inspection, Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged, grain straw only.			^l Certified mulch will be indicated by label.

V. Landscaping and Erosion Control Items (cont.)

Pay Item No	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2571 2575 2577	13. Mulch Material B. Type 6 Mulch – Woodchips	3882	Visual Inspection, one gradation per supplier.	Gradation 1/10,000 yd ³ per supplier.		All wood chips supplied by a supplier outside the Emerald Ash Borer quarantine area or have an Emerald Ash Borer Compliance Agreement with the MDA.
2502 2575 2577	14. Seeds A. Seeds (Certified Vendors Only) (Mixes 22-000 and 25-000 series) ^m	3876	Check for Certified Vendor tag from Minnesota Crop Improvement Association. If materials are on hand and past the twelve months, testing must be done.		0.5 L (1 pint)	^m Periodic sampling taken by Office of Environmental Services. Any moldy or insect contaminated seed must be rejected.
2502 2575 2577	14. Seeds B. Native Seed (Mixes 30-000 series) certified seed only ⁿ	3876	Check if from Certified Vendor by Minnesota Crop Improvement Association. Must be tagged. If materials are on hand and past the twelve months, testing must be done.			ⁿ Certified seed will be indicated by label on containers. Reject all moldy or insect contaminated seed. Periodic sampling taken by Office of Environmental Services.
2575	15. Sod ^o	3878	A certified tag by Minnesota Crop Improvement Association for Salt tolerant sod. Final Visual Inspection at site.			^o A Certificate of Compliance must be furnished by the producer to the Engineer for the type of sod supplied showing correct grass varieties.
2571 2575	16. Compost A. Compost Certified Source ^p	3890	Visual Inspection			^p Check Approved/Qualified Products List (A/QPL).
2571 2575	17. Compost B. Compost Non-Certified Source ^q	3890		Must be sampled - One Sample per 300 m ³ (500 Cu Yd)		^q Submit samples six weeks before use. Small quantity 75 m ³ (100 Cu Yd) or less.
2575	18. Hydraulic Soil Stabilizer ^r	3884	Slump Test for Type 8	None		^r Check Approved/Qualified Products List (A/QPL).

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401	Asphalt Plank	3204	Visual Inspection	1 per 1,000 plank or less of each thickness in each shipment	3 – 1 m (yd) pieces samples from different planks	
2131	Calcium Chloride	3911	Visual Inspection	Liquid: 1 per 40,000 L (1 per 10,000 gal) Dry: 1 per shipment	0.5 L (1 pint) or 0.5 kg (1 lb.) in Plastic Container	
2131	Magnesium Chloride	3912	Visual Inspection	1 per 40,000 L (1 per 10,000 gal.)	0.5 L (1 pint) in Plastic Container	
2331	Hot-Pour Crack Sealant for Crack Sealing/Filling	3719 3723 3725	Visual Inspection	1 per lot. Take samples from application wand. Use caution when handling hot containers	2.26 kg (5 lb.) in a 1 gal steel container.	
2481	Waterproofing Materials Membrane Waterproofing System	3757	Visual Inspection	1 per shipment (Membrane Only)	0.1 m ² (1 Sq Ft)	Only waterproofing systems from qualified sources are allowed for use. The most current list can be found at www.dot.state.mn.us/products Membrane Waterproofing System: The manufacturer shall submit a one square foot sample of the membrane along with a letter of Certification and test results stating that the membranes meet the requirements of this specification. Other components of the waterproofing system do not need to be sampled for testing.

Schedule of Materials Control

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2481	Waterproofing Materials Three Ply System Asphalt Primer	3165	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Waterproofing Asphalt	3166	Visual Inspection	1 per shipment	0.5 L (1 pt.) in steel container	
2481	Waterproofing Materials Three Ply System Fabric	3201	Visual Inspection	1 per shipment	1 m ² (1 Sq yd)	
2582	Waterborne Latex Traffic Marking Paint.	3591	Visual Inspection	1 per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Epoxy Traffic Paint	3590	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us/products
2582	Traffic Marking Paint	Special Provisions	Visual Inspection	1 Part A per lot 1 Catalyst Part B per lot	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance. Only traffic marking paints from Qualified Products List are allowed for use. The most current Qualified Products list can be found at www.dot.state.mn.us For traffic marking paints other than Waterborne Latex and Epoxy. See Special Provision for Qualified Products List.
2564	Non-Traffic Striping Paints	3500 Series Special Provisions	Visual Inspection		0.5 L (1 pint)	Form 02415 List batch numbers and retain Certification of Compliance. For all others, see Special Provisions. Send color sample to Chemical Laboratory for color matching.

Schedule of Materials Control

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2478	Bridge Structural Steel Paint	3520	Visual Inspection	Certificate of Compliance with each batch/lot for each component of the paint system to the Engineer. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.		Form 02415 List batch numbers and retain Certificate of Compliance. Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/ .
	Exterior Masonry Paint	3584	Visual Inspection	1 per lot Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.	0.5 L (1 pint)	Form 02415 List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
	Noise Wall Stain	Special Provisions	Visual Inspection	Certificate of Compliance for each batch/lot of paint. Provide a color "Draw Down" sample to the Mn/DOT Chemical Laboratory for verification of the finish coat color.		Form 02415 List batch numbers and retain Certificate of Compliance Only paints from Approved Products List are allowed for use. The most current Approved Products List can be found at www.dot.state.mn.us/
2582	Drop-on Glass Beads	3592	Visual Inspection	1 per lot	1 L (qt.)	Form 02415 List batch numbers and retain Certificate of Compliance Only glass beads from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products
2502 2581 2582	Pavement Marking Tape	3354 3355 Special Provisions	Visual Inspection	1 clean sample of each color per lot	3 m (3 yds.)	Form 02415 List batch numbers and retain Certificate of Compliance. Only pavement marking tape from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

VI. Chemical Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2540 2563 2564 2565 2582	Signs and Markers	3352	Visual Inspection	None unless material suspect		Form 02415 Only Signs and Markers from Qualified Products List are allowed for use. The most current Qualified Products List can be found at www.dot.state.mn.us/products

VII. Metallic Materials and Metal Products

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2554	1. Guard Rail A. Fittings - Splicers, Bolts, etc.	3381	Visual Inspection	Bolts: 2 Post bolts and 4 splice bolts with nuts for each 1,000 units or less.		Form 02415 or 2403 To be approved before use. Materials from H&R may be pre-sampled and tested. Call the MN/DOT inspector at 218-846-3613 to see if material has been approved. For non-pre-tested, submit laboratory samples at required rate. For small quantities, lab samples are not required, but document on Form 02415 or 2403 and maintain in project file. Small Quantities: Rail Sections - 20 or less Terminals - 10 or less Post Bolts - 100 or less, Splice Bolts - 100 or less
2554	1.B.i. Non-High Tension Guard Rail Cable	3381	Visual Inspection	1 sample from each spool	1.2 m (4 ft)	Form 02415 or 2403 See VII.1.A.
2554	1. B.ii. High Tension Guard Rail Cable	Special Provisions	Visual Inspection	1 sample per 50,000 feet	1.2 m (4 ft)	
2554	1. Guard Rail C. Structural Plate Beam	3382	Visual Inspection	One sample from one edge of each 200 rail sections or one sample of each 100 terminal sections	Full depth x 0.25 m (full depth x 10")	Form 02415 or 2403 See VII.1.A.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2554 2564	2. Steel Sign Posts	3401	Visual Inspection & Certification from Contractor of compliance with Domestic source requirement under 1601, if applicable.	Two posts per shipment of each mass per unit length. Submit shortest full sized length of each weight, not a scrap piece.	See note	Form 02415 or 2403 Check domestic steel requirement under 1601
2554 2557	3. Posts for Traffic & Fence A. Steel fence posts, brace bars, and rails	3403 3406	Visual Inspection	One sample per 500 pieces. Submit full length for posts used in the ground (line, terminal, "C" and anchor posts), and 5' length of top rail and brace bar.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance and certified mill analysis in project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence B. Components: includes cup, cap, nut, bolt, end clamp, tension band, truss rod tightener, hog ring, tie wire, tension stretcher bar, truss rod, clamp, & tension wire	3376	Visual Inspection	1 each of cup, cap, nut, bolt, end clamp, tension bands, truss rod tightener, 12 hog rings, 6 tie wires, 1 tension stretcher bar; 1 truss rod, cut to 2-foot min. with threaded section, 3 feet of tension wire.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence C. Gates	3379	Visual Inspection	No sample required. See notes.		Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence D. Barbed Wire	3376	Visual Inspection.	One full height sample per 50 rolls	1 m (3 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form on right side of page, www.dot.state.mn.us/materials/lab.html

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2557	3. Fence E. Woven Wire Fabric	3376	Visual Inspection	One full height sample per 50 rolls	1 m (3 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for cert. form right side of page, www.dot.state.mn.us/materials/lab.html
2557	3. Fence F. Chain Link Fabric	3376	Visual Inspection	One full height sample for each 5,000 ft of fencing.	0.3 m (1 ft)	Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. Retain Certificate of Compliance in the project file. See link for certification form on right side of page, www.dot.state.mn.us/materials/lab.html
2402	4. Water Pipe and other Piping Materials	3364, 3365, 3366 & Special Provisions				Form 02415 or 2403 Check domestic steel requirement under 1601 Special Provision. To be identified & tested if necessary prior to use. See Special Provisions.
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel A. Bars -- Uncoated	3301	Visual Check for Size and Grade Marking	No Field Sample Necessary		Form 02415 or 2403 For Uncoated bars - Retain Certificate of Compliance and Certified Mill Analysis in Project File.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2201 2301 2401 2405 2411 2412 2433 2452 2472 2514 2531 2533 2545 2564	5. Reinforcing Steel B. Bars - Epoxy Coated	3301	Visual Check for Size and Grade Marking and "Inspected" tag	One sample (1 bar) of each size bar for each day's coating production	1 m (3 ft)	Form 02415 or 2403 For Epoxy-Coated bars, steel will be tagged "Inspected" when it has been sampled and tested by Mn/DOT prior to shipment, and it will be tagged "Sampled" when testing has not been completed prior to shipment. If the Epoxy-Coated bars are not tagged "Sampled" or "Inspected", submit samples with copies of the , Certificate of Compliance, and Certified Mill Analysis. Retain originals of the Certificate of Compliance and Certified Mill Analysis in the project file.
2401	5. Reinforcing Steel C. Bars Stainless Steel	Special Provisions		One sample (2 Bars) per heat per bar size	1 m (3 ft)	Submit copies of mill test reports with samples, retain originals in project file
2401 2411 2452 2472 2564	5. Reinforcing Steel D. Spirals	3305		One per shipment	1 m (3 ft)	Same as 5.B
2201 2301 2401 2411 2412 2472 2531	5. Reinforcing Steel E. Steel Fabric	3303	Visual Inspection	No Field Sample Necessary		Retain Certificate of Compliance in project file.
2201 2301 2401 2411	5. Reinforcing Steel F. Dowel Bars	3302		One Dowel Bar from each shipment	Full Size Dowel Bars	For all types of dowels – Each project shall have a Certificate of Compliance from the Manufacturer certifying that all materials used in fabrication of the dowel bars and baskets comply with all applicable specifications. The Manufacturer shall maintain all records necessary for certification by project. The Certificate of Compliance shall be submitted to the Project Engineer.

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2401 2405	5. Reinforcing Steel G. Prestressing or Post-Tensioning Strand	3348		One sample (2 strands) from each heat (see Notes)	1.8 m (6 ft)	Submit one copy of mill certificate and one copy of the stress-strain curve representative of the lot with the samples. For most manufacturers, a heat equals a production lot, and an individual lot, pack, or reel is a subset of a heat/production lot.
2402 2506 2565	6. Drainage and Electrical Castings	3321 2471 2565	Visual Inspection	All castings: Three tensile bars to be cast with each heat at Foundry and submitted to the lab by an approved Foundry*. See 3321.		Form 02415 or 2403 Call Maplewood Laboratory at 651-366-5540 for list of approved foundries, or see website. Inspect in the field and retain Form 02415 or 2403 in project file, showing name of foundry and quantity
2401 2402 2411 2433 2545 2554 2564 2565	7. Anchor Rods (Cast in Place) and Structural Fasteners	3385 3391	Visual Inspection and Material verification testing.	Pre-approved (see notes) or one complete anchor rod assembly including nuts and washers from each lot supplied.		Pre-approved system requires supplier to submit a sample to the Department yearly for each anchor rod or fastener type. Test results of sample must verify compliance to product specifications. Supplier shall retain copy of passing test results for one year and supply with subsequent jobs. When no previous test results are available, one complete anchor rod assembly with all required nuts and washers shall be sampled and tested from each type on the project. Prior to installation, field to obtain copy of passing test report(s).
2401 2411 2433	8. Anchorages (Drilled In)	Special Provisions	Visual Inspection	No laboratory samples required		Note: Before installation, verify that anchorages are on the qualified products list www.dot.state.mn.us/products
2402	9. Structural Steel A. For Steel Bridge – Beams, Girders, Diaphragms, etc.	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2405	9. Structural Steel B. For Concrete Girders- Diaphragms and sole plates	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel C.. Expansion joints	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel D. Steel Bearings	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel E. Railing-Structural tube and ornamental	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag. An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402	9. Structural Steel F. Drainage Systems	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2402	9. Structural Steel G. Protection Angles	2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2564	10. Overhead Sign structures	2564 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VII. Metallic Materials and Metal Products (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	11. High Mast Lighting Structures	2545 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/
2565	12. Monotube Signal Structures	2565 2471	Structural Metals Inspection Tag and field inspection for damage/defects	None		Structural metals products will be inspected at the plant and will be shipped with a Structural Metals Inspection Tag . An inspection confirmation report will be completed by Structural Metals Inspection staff and sent to the field personnel. Only approved suppliers are allowed to supply Structural Metals products. A list of approved suppliers can be found on the Bridge Office web site: http://www.dot.state.mn.us/bridge/

VIII. Miscellaneous Materials

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2403 2422 2452 2521 2540 2545 2554 2557 2564	1. Timber, Lumber Piling & Posts	3412 to 3471 & 3491	Visual Inspection			Form 02415 or 2403 Untreated materials shall be inspected in the field and the results reported on Form 02415 or 2403. Treated materials shall be Certified on the Invoice or Shipping Ticket. Material is inspected and stamped by an Independent Agency as per Specification 3491. Contact Laboratory for additional information.
2402 2405 2557 Many	2. Miscellaneous pieces and Hardware (Galvanized)	3392 3394		3 samples of each item per shipment. Sample critical items only. (Critical items are load bearing, structurally necessary items.)	Three of each type.	Form 02415 or 2403 Will carry "Inspected" tag if sampled and tested prior to shipment. No sample necessary if "Inspected".
2504	3. Insulation Board	3760	Visual Inspection	None		Form 02415 or 2403
2402	4. Elastomeric Bearing Pads	3741 and Special Provisions	Check dimensions Check repair of tested pad	One sample, with one or more internal plates annually from each manufacturer.	Full size pad	Submit copy of Certificate of Compliance with pad. Do not use any pads that are not certified.

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2402 2422 2501 2503 2506	1. Corrugated Metal Products A. Culvert Pipe Underdrains Erosion control Structures	3225 thru 3229, 3351 and 3399	Visual Inspection: Check for good construction, workmanship, finish requirements and shipping			Form 02415 or 2403 Make certain pipe is Certified on Invoice, retain certificate of compliance and certified mill analysis in project file
2501	1. Corrugated Metal Products B. Structural Plate	3231	Visual Inspection: Invoice shall include notation that material described is in accordance with fabricator's Certificate and Guarantee			Same as 1.A

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Schedule of Materials Control

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2501	1. Corrugated Metal Products C. Aluminum Structural Plate	3233				Retain certificate of compliance and certified mill analysis in project file
2503 2506	2. Clay Pipe	3251	No samples required for less than 100 pieces	1 sample per 200 pieces of each size.	Full Size Pipe	Form 02415 or 2403
2501 2503 2506	3. Concrete Pipe A. Reinforced Pipe and Arches Precast Cattle Pass Units Sectional Manhole Units	3236	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Form 02415 or 2403 For Concrete Pipe Both A & B: Product will be certified by producer, only spot checks are done by plant inspector. Make certain the invoice or certification documents is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used
2503 2506	3. Concrete Pipe B. Non-Reinforced Concrete Pipe	3253	Field Inspection: Check for damage and defects. Check dimensions as required. Check for producer's "Certified" stamp and signature on the certification document.		Full Size Pipe	See 3.A
2501 2503 2506	3. Concrete Pipe Fine Aggregate	3126		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	
2501 2503 2506	3. Concrete Pipe Coarse Aggregate	3137		1 quality test per month during production for A and B above.	10 kg. (25 lb.)	

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2412	4. Precast/Prestressed Concrete Structures	3238	1 Air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	A. Reinforced Precast Box Culvert					
	Fine Aggregate				10 kg. (25 lb.)	
2405	Coarse Aggregate	3137		1 quality test per month during production.	10 kg. (25 lb.)	
	4. Precast/Prestressed Concrete Structures	2405	1 air test per day (1st load), 2 cylinders per pour for positive slump concrete (1 for handling, 1 for shipping).	1 "companion" cylinder per month per plant during production, or cylinder testing machine, whichever is greater. Call Precast Inspection Engineer at 651-366-5540 for additional information.		Precast/prestressed Concrete Structure (beams, posts, etc.) will be inspected and stamped at plant. Field personnel are responsible for checking for plant inspector's stamp, for shipping/handling damage or defects, and dimensions. An inspection report will be completed by plant personnel and sent to the field personnel.
	B. Precast/Prestressed Concrete Structure (beams, posts, etc.).					
	Fine Aggregate	3126	Gradation: 1 per 150 m ³ (200 Cu. yd.) or fraction thereof. 1 per day of production or 3 per week, whichever is less.	1 gradation and 1 quality test per month during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	
	Coarse Aggregate	3137	Gradation: 1 per 75 m ³ (100 Cu yd) or fraction thereof. 1 per day of production or 3 per week, whichever is less.	1 gradation and 1 quality test per month during production from a split sample. Include producer's gradation results on sample card.	10 kg (25 lb.)	

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	5. Manholes and Catch Basins (Construction)	2506 3622	Field Inspection: Check for damage and defects. Check dimensions as required. Check for Producer's "Certified" stamp and signature on the certification document.			Form 02415 or 2403 Product will be certified by producer or inspected, tested and stamped at source. Only spot checks are done by plant inspector. Make certain the invoice or certification document is signed and the product has the required markings. Maintain Form 2403 or 02415 in project records, showing source of materials and type and quantity used (bricks, blocks, precast, or combination).
2502	6. Drain Tile (Clay or Concrete)	3276	Visual Inspection	2 samples of each size from each source		
2502 2503	7. Thermoplastic (TP) Pipe ABS and PVC	3245	Obtain Certificate of compliance. Check for approved marking printed on pipe. Field Inspect for damage or defects.			Form 02415 or 2403 See Spec. 3245 for specific AASHTO or ASTM Pipe types are approved under this specification. If perforated, holes should be 5mm - 10 mm (3/16 - 3/8 inch) diameter, two rows for 4", and four rows for 6" diameter; approximately 75 mm (3 inches) on center.
2502	8. Corrugated Polyethylene Pipe – Single wall for edge drains, etc.	3278	Check for markings (AASHTO M 252) Certificate of Compliance. Field Inspect for damage or defects.	No Laboratory tests required		Form 02415 or 2403
2503	9. Sewer Joint Sealing Compound	3724		One per shipment	0.5 liter (1 pt.)	
2412 2501 2503	10. Preformed Plastic Sealer for Pipe	3726 Type b		One from each source	0.3 m (1 ft)	
2412 2501 2503	11. Bituminous Mastic Joint Sealer for Pipe	3728	Visual Inspection	Sample, if questionable		

IX. Geosynthetics, Pipe, Tile, and Precast/Prestressed Concrete (Cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105	12. EPS Geofoam	Special Provisions	Visual Inspection Check for yellow aged material, uniformity and dimensions. Weigh 1'x1'x1' cut coupon to verify density every 200 m ³ (250 yd ³)			Form 02415 or 2403
2501 2503	13. Corrugated Polyethylene Pipe -- Dual Wall, 12" -- 48"	3247				For Specification 3247, Corrugated Polyethylene Pipe (HDPE) manufacturing facilities are required to be reviewed yearly and in compliance with AASHTO's National Transportation Product Evaluation Program (NTPEP) for producers of AASHTO M294 HDPE pipe. To determine if a pipe manufacturing plant is qualified, click on the following link for M294 pipe. http://archive.data.ntpep.org/nap/statusReport_PlasticPipe.aspx If a plant has a compliant NTPEP audit for AASHTO M294 pipe at the time the pipe is manufactured, then the plant has met requirements. Note that a previous year's audit shall govern until NTPEP issues the next year's audit. A Certificate of Compliance shall be provided in accordance with Specification 1603.

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2105 2411 2412 2501 2502 2511 2512	14. Geotextile Fabric and Geogrid Reinforcement	3733 and Special Provisions	Inspect for damage and uniformity of texture. Rolls of both geotextile and geotextile wrapped PE Tubing must be wrapped in UV protective plastic. (Usually Black). Obtain Certificate of Compliance	<p>(a) 1 per project for pipe wrap or trench lining for Permeable base designs.</p> <p>(b) 1 per 50,000 yd² (40,000 m²) or fraction thereof of each type fabric or geogrid for all other uses.</p> <p>(c) Sewn seam, if required, 1 per project minimum, additional as appropriate.</p> <p>Small Quantity Acceptance</p> <ul style="list-style-type: none"> For fabric totals less than 200 yd² (170 m²) No sampling required Use Inspection Report for Small Quantities (Form 2403) Check: <ul style="list-style-type: none"> Certificate of Compliance Identifying label on product Geotextile Small Quantity Acceptance List at http://www.dot.state.mn.us/materials/aggregatedocs/gtxlist.pdf 	<p>(a) 10 Lin. Ft. (3 m)</p> <p>(b) 4 yd² (3 m²)*</p> <p>(c) 10 Lin. Ft. (3 m)**</p>	<p>Certificate of Compliance shall state material identification (e.g. Propex 2002, Miragrid 8XT), and minimum average roll values (MARV) for all specified geotextile properties. MARV values must meet the Specification 3733 Types 1 through 7 requirements for the specific application. Submit copy of Certificate with material samples sent to the Materials Laboratory.</p> <p>Submit additional sample(s), if the manufacturer or model of geotextile or geogrid used changes during construction.</p> <p>Sampling shall be by random selection and no more than one sample shall be taken from an individual roll. For type 6 applications (including geogrids), submit pages of Special Provisions that list required material properties. (Type 6 requirements are job specific.) For Modular Block Walls or Reinforced Soil Slopes, submit page(s) of shop drawings that reference geogrid/geotextile to be used (product name) and/or required properties.</p> <p>* Do not sample first full turn of rolled product. ** Seam sample to include approximately 3 ft (1 m) of geosynthetic material on each side of seam (in direction perpendicular to seam).</p>

Schedule of Materials Control

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2506	1. Brick A. Sewer (clay) and Building	3612 to 3615	Visual Inspection	One sample per 50,000 brick or fraction thereof	6 whole bricks	
2506	1. Brick B. Sewer (Concrete)*	3616	Visual Inspection	One sample per shipment.	6 whole bricks	* Air entrainment required. Obtain air content statement from supplier.
2506	2. Concrete Masonry Units A. For Sewer Construction	3621	Visual Inspection	One sample per shipment	6 whole units	Air entrainment required. Obtain air content statement from supplier.
2411	2. Concrete Masonry Units B. For Modular Block Retaining Walls	Special Provisions	Visual Inspection Check for cracks and broken corners	One sample per 10,000 units or fraction thereof, with a minimum of one sample per product (block) type per contract.*	5 whole units	All lots of block upon delivery shall have Manufacturer or Independent laboratory test results to verify passing both compression and freeze-thaw requirements. * Wall units and cap units are considered separate block types.
2422	3. Reinforced Concrete Cribbing	3661	Concrete control tests Air Tests Visual Inspection if previously tested	One cylinder per 100 units, but not less than 5 cylinders for a given contract. Other materials as required herein.	150 x 300mm (6 x 12 in) Cylinders	Form 02415 or 2403 Will be stamped when inspected prior to shipment.
2511 2512 2577	4. Stone for Masonry or Rip-Rap	3601 and Special Provisions	Visual Inspection Submit Form 02415 unless special testing is specified			Form 02415 or 2403 Each source shall be approved by Project Engineer or Supervisor for quality, prior to use. For questions on quality, contact District Materials or Geology Unit.

XI. Electrical and Signal Equipment Items

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545	1. Lighting Standards (Aluminum or Steel)	3811	Visual Inspection			The Fabricator shall submit "Certificate of Compliance", on a per project basis, to the Project Engineer..
2545 2550 2565	2. Hand Holes (Precast, PVC, and LLDPE)	2545 2550 2565				Form 02415 or 2403 Traffic signals and street lighting projects require handholes and frames and covers to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for signal. For cast iron frame and cover: see VII.6, Drainage Castings
2545 2565	3. Foundation	2545	Slump as needed	1 cylinder per 20 m ³ (25 Cu. yd.)		Rebar is required in concrete foundations as specified in the Contract documents for all traffic signal and street lighting projects.
2402 2545 2565	4. Conduit and Fittings A. Metallic	3801 3802	Visual Inspection	None		Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). Retain Form 02415 or 2403 in Project File
2545 2565	4. Conduit and Fittings B. Non-Metallic (Rigid and HDPE)	3803 Special Provisions	Visual Inspection			Form 02415 or 2403 Conduit shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL). Retain Form 02415 or 2403 in Project File. For traffic signal and street lighting projects, specific requirements are contained in the Special Provisions for each project.
2545 2565	5a. Anchor bolts (cast in place)	2545 2565				See section VII, 7.
2545	5b. Anchorages (Drilled In)	2545				See section VII, 8.

XI. Electrical and Signal Equipment Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	6. Miscellaneous Hardware	2545 2565	Visual Inspection	Sample critical items only. One of each item per shipment. (Critical Items are load bearing, structurally necessary items.)		Will carry "Inspected tag if sampled and tested prior to shipment. No sample necessary if "Inspected". Do not use if not tested. Field sample at sampling rate for laboratory testing. For traffic signal and street light lighting projects, various miscellaneous hardware is required to be listed on the Mn/DOT Signals and Lighting Approved/Qualified Products Lists (A/QPL). The Contract documents indicate which items must be on the Signals and/or Lighting APL.
2545 2550 2565	7. Cable and Conductors A. Power Conductors Loop Detector Conductors (No Tubing)	3815.2B1 3815.2B2(a)	Visual Inspection	None		Form 02415 or 2403 Make certain the conductors are the type specified. Submit Field Inspection report showing type and quantities used. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type where applicable.
2545 2550 2565	7. Cable and Conductors B. Electrical Cables and Single Conductors with Jacket	3815.2B2(b) 3815.2B3 3815.2B5 3815.2C1 3815.2C3 3815.2C4 3815.2C5 3815.2C6 3815.2C7 3815.2C8 3815.2C14 Special Provisions	Visual Inspection	1 sample per size per lot	1.5m (5 ft)	Form 02415 or 2403 Usually inspected at the distributor. Documentation showing project number, reel number(s), & Mn/DOT test number(s) will be included with each project shipment. If such documentation is not received from Contractor, submit sample for testing along with material certification from manufacturer. Do not use if not tested. Pre-inspected materials will not be tagged; an inspection report will be sent by the Mn/DOT inspector for each shipment. Project inspectors should verify that the shipping documents agree with this inspection report. Call Steve Grover at 651-366-5540 or Cindy Schellack at 651-366-5543 with questions. For traffic signal and street lighting projects, the Special Provisions for each project contain electrical cable and conductor specifications.
2545 2550 2565	7. Cable and Conductors C. Fiber Optic Cables	3815.2C13	Visual Inspection - verify make and model number as shown in Special Provisions	None		Form 02415 or 2403 Fiber optic cables shall be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Traffic Management Systems/ITS.

XI. Electrical and Signal Equipment Items (cont.)

Pay Item No.	Kind of Material	Spec. No.	Minimum Required Acceptance Testing (Field Testing Rate)	Minimum Required Sampling Rate for Laboratory Testing	Sample Size	Notes
2545 2565	8. Ground Rods	2545 2565	Visual Inspection	None.		Form 02415 or 2403 Retain Form 02415 or 2403 in project file. Shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL).
2545	9. Luminaires and Lamps	3810				Form 02415 or 2403 Traffic signal and street lighting projects require luminaires and lamps to be listed on the Mn/DOT Approved/Qualified Products List (A/QPL) for Lighting. The conductors shall be labeled as being listed by a National Recognized Testing Laboratory (NRTL) and type, where applicable.
2545	10. Electrical Systems					Electrical Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report. To be certified by the Project Engineer.
2565	11. Traffic Signal Systems	2565				Traffic Signal Systems are to be reported as a "System" using the Lighting, Signal, and Traffic Recorder Inspection Report. To be certified by the Project Engineer.

SCHEDULE OF PRICES

NOTICE TO BIDDERS

Particular note should be made in regard to the clarity of numerals (figures) and to the procedure for alterations and the required certificate as directed by Section 1301.

The following abbreviations may be used in item description and unit of measure in the Schedule of Prices.

A	Arch	JA	Jacked
A-S	Antiseepage	LIN FT	Linear Feet
AB	Asbestos Bonded	LG	Long
ACT	Actuated	MAINT	Maintenance
AGG	Aggregate	MATL	Material
ALUM	Aluminum	MGM	1000 Board Feet
ASB	Asbestos	MET	Metal
ASPH	Asphaltic	MOD	Modification
ASSY	Assemblies	MPA	Metal Pipe Arch
B+B	Balled & Burlapped	MTD	Mounted
BC	Bituminous Coated	NON MET	Non Metallic
BIT	Bituminous	NON PERF	Non-Perforated
BLDG	Building	NON REINF	Non-Reinforced
BR	Bridge	OH	Overhead
CAL	Caliper	P-A	Pipe-Arch
CB	Catch Basin	PAVT	Pavement
CEM	Cement	PERF	Perforated
C and G	Curb and Gutter	PL	Plate
CI	Cast Iron	PNEUM	Pneumatic
C-I-P	Cast-in-Place	PREC	Precast
CL	Class	PREST	Prestressed
COMM	Commercial	PVC	Poly Vinyl Chloride
CONC	Concrete	RPCA	Reinforced Concrete Pipe Arch
COND	Conductor	REINF	Reinforced
CONN	Connection	RELO	Relocation
CONST	Construct	RESTOR	Restoration
CONT	Continuously	RMC	Rigid Metallic Conduit
CP	Cattle Pass	RNMC	Rigid Non Metallic Conduit
CTD	Coated	RDWY	Roadway
CU FT	Cubic Feet	S-G	Sand & Gravel
CU YD	Cubic Yard	SIG	Signal
CULV	Culvert	SPE	Special
CWT	Hundred Weight	SQ FT	Square Feet
DES	Design	SQ YD	Square Yard
DBL	Double	STA	Station
DI	Drop Inlet	STD	Standard
DIAM	Diameter	STL	Steel
DRWY	Driveway	STKPL	Stockpile
EXC	Excavation	STR	Strength
EXP	Expansion	STRUCT	Structural
FAB	Fabric	SPPA	Structural Plate Pipe Arch
FE	Fence	SYS	System
FERT	Fertilizer	T	Traffic
F+I	Furnish & Install	TBR	Timber
FOUND	Foundation	TEMP	Temporary
FT LG	Feet Long	THERMO	Thermoplastic
FURN	Furnish	TRTD	Treated
GA	Gauge	UNDERGRD	Underground
GRAN	Granular	UNTRTD	Untreated
HI	High	VAR	Variable
INP	In Place	VM	Vehicular Measure
INST	Install	WEAR	Wearing

INSURANCE

The contractor shall not commence work under this contract until he has obtained the following insurance, and such insurance has been approved by the Blue Earth County Attorney.

The Contractor shall deposit with the County Auditor the original, or a certified duplicate copy thereof as applicable to this project, of the Public Liability and Property Damage Insurance and Extended Coverage Policies, required hereunder. The Contractor shall furnish the County with a certificate of insurance from the insurance company issuing the policies as is herein required. All policies shall remain in force and effect on thirty days written notice to the County Auditor before cancellation. The above insurance policies shall be submitted at the same time as the contract and bond as provided in Minn. Statutes 1306.

The Contractor shall procure and maintain during the life of the Contract and until the Contract has been fully accepted, insurance policies in accordance with Minnesota Department of Transportation Standard Specifications for Construction 2005 Edition, the project Special Provisions, and as follows:

(A) PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE: For and on behalf of himself, the County of Blue Earth as joint assureds, and with a cross-liability endorsement protection of the County of Blue Earth from claims or damages for personal injuries, including accidental death, as well as for claims for property damage which may arise by the Contractor or by a subcontractor or by anyone directly or indirectly employed by either of them.

Said Public Liability and Public Property Damage Insurance Policy shall provide that the insurance company waives the right to assert the immunity of the County as a defense to any claims made under said insurance.

The amount of such insurance will be as follows: Public Liability Insurance in an amount of not less than Two Million Dollars (\$2,000,000.00) for all damages arising out of bodily injuries to, or death of one person and subject to the same limit for each person in a total amount of not less than Two Million Dollars (\$2,000,000.00) on account of one accident, and property damage insurance in an amount not less than Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property in any one accident and subject to that limit, a total limit of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property during the policy period.

(B) WORKER'S COMPENSATION INSURANCE: For all his employees employed at the site of the project and, in case any work is sublet, the Contractor shall require the subcontractor to provide Worker's Compensation Insurance for all his employees in accordance with the Minnesota Department of Transportation Standard Specifications for Construction 2005 Edition and the project Special Provisions.

(C) AUTOMOBILE PUBLIC LIABILITY INSURANCE: Two Million Dollars (\$2,000,000.00) for all damages arising out of bodily injuries to, or death of one person, and subject to that limit for each person, a total of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property in any one accident and subject to that limit, a total of Two Million Dollars (\$2,000,000.00) for all damages to or destruction of property during the policy period, if any motor vehicles are engaged in operations within the term of the contract on the site of work covering the use of all such motor vehicles unless such coverage is included in the insurance provided for under subsection "A" hereof.

(1714) RESPONSIBILITY FOR DAMAGE CLAIMS

The first paragraph of 1714 is revised to read as follows:

The Contractor shall indemnify and save harmless the State of Minnesota, the County of Blue Earth, their officers and employees from all suits, actions, and claims of any character brought because of injuries or damages received or sustained by any person, persons, or property on account of the operations of the said Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims arising or amounts recovered from infringements of patent, trademark, or copyright; or because of any claims arising or amounts recovered under the Worker's Compensation Act; or under any other law, ordinance, order or decree.

PROOF OF WORKER'S COMPENSATION INSURANCE COVERAGE

Minnesota Statute Section 176.182 requires every state and local licensing agency to withhold the issuance or renewal of a license or permit to operate a business in Minnesota until the applicant presents acceptable evidence of compliance with the workers' compensation insurance coverage requirement of Section 176.181, Subd. 2. The information required is: The name of the insurance company, the policy number, and dates of coverage or the permit to self-insure. This information will be collected by the licensing agency and put in their company file. It will be furnished, upon request, to the Department of Labor and Industry to check for compliance with Minnesota Statute Sec. 176.181, Subd. 2.

This information is required by law, and licenses and permits to operate a business may not be issued or renewed if it is not provided and/or is falsely reported. Furthermore, if this information is not provided and/or falsely reported, it may result in a \$1,000 penalty assessed against the applicant by the Commissioner of the Department of Labor and Industry payable to the Special Compensation Fund.

Provide the information specified above in the spaces provided, or certify the precise reason your business is excluded from compliance with the insurance coverage requirement for workers' compensation.

Insurance Company Name _____
(NOT the insurance agent)

Policy Number or Self-insurance Permit Number: _____

Dates of Coverage: _____

(or)

I am not required to have worker's compensation liability coverage because:

() I have no employees covered by the law.

() Other (Specify) _____

I HAVE READ AND UNDERSTAND MY RIGHTS AND OBLIGATIONS WITH REGARDS TO BUSINESS LICENSES, PERMITS, AND WORKER'S COMPENSATION COVERAGE, AND I CERTIFY THAT THE INFORMATION PROVIDED IS TRUE AND CORRECT.

(SIGNATURE)

AFFIDAVIT OF NON-COLLISION

BIDDER _____

ADDRESS _____

I hereby swear (or affirm) under the penalty of perjury:

(1) That I am the bidder, (if the bidder is an individual), a partner in the bidder, (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation);

(2) That the attached bid or bids have been arrived at by the bidder independently, and have been submitted without collusion with and without any agreement, understanding or planned common course of action with, any other vendor of materials, supplies, equipment, or services described in the invitation to bid, designed to limit independent bidding or competition;

(3) That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids, and will not be communicated to any such person prior to the official opening of the bid or bids;

(4) That I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Signed _____

Firm Name _____

Subscribed and sworn to before me

this _____ day of _____, _____

Notary Public

My Commission Expires _____

6/7/2011

Contract No.: 11102

Blue Earth
Schedule Of Prices By Category By Contract Projects

Project Number: 102

Project Title or Road Number: Contract No.: 11102 - 102 - Red Jacket Bridge #6961, South Pier & Erosion Stabilization

Work Type: 102 - Bridge Replacement

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.

Item No.	Description	Units	Quantity	Unit Price	Total Price
Project 102					
PARTICIPATING					
2011.601	CONSTRUCTION STAKING	LUMP SUM	1.00		
2021.501	MOBILIZATION	LUMP SUM	1.00		
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1.00		
2401.501	STRUCTURAL CONCRETE (1A43) (P)	CU YD	83.00		
2401.501	STRUCTURAL CONCRETE (3Y43) (P)	CU YD	267.00		
2401.541	REINFORCEMENT BARS (P)	POUND	5,210.00		
2401.541	REINFORCEMENT BARS (EPOXY COATED) (P)	POUND	91,650.00		
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1.00		
2401.601	SLOPE PREPARATION	LUMP SUM	1.00		
2401.601	FOUNDATION PREPARATION PIER	LUMP SUM	1.00		
2402.521	STRUCTURAL STEEL (3309) (P)	POUND	11,600.00		
2402.595	BEARING ASSEMBLY (P)	EACH	2.00		
2402.601	ASSEMBLE AND INSTALL SALVAGED BRIDGE	LUMP SUM	1.00		
2403.502	TREATED TIMBER	MBM	0.50		
2403.506	HARDWARE	POUND	100.00		
2411.618	ANTI-GRAFFITI COATING (P)	SQ FT	2,314.00		
2411.618	ARCHITECTURAL SURFACE FINISH (MULTI COLOR) (P)	SQ FT	3,090.00		
2411.618	ARCHITECTURAL CONCRETE TEXTURE (ROCK FACE) (P)	SQ FT	2,314.00		
2433.516	ANCHORAGES TYPE 1 (P)	EACH	22.00		
2433.603	REPAIR STRUCTURAL CRACKS	LIN FT	150.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.

Item No.	Description	Units	Quantity	Unit Price	Total Price
2451.509	AGGREGATE BEDDING (CV) (P)	CU YD	93.00		
2452.510	STEEL H-PILING DRIVEN 12"	LIN FT	340.00		
2452.511	STEEL H-PILING DELIVERED 12"	LIN FT	340.00		
2452.520	STEEL H-TEST PILE 25 FT LONG 12"	EACH	1.00		
2452.618	STEEL SHEET PILING (PERMANENT) (P)	SQ FT	1,519.00		
2511.501	RANDOM RIPRAP CLASS V (P)	CU YD	413.00		
2573.602	TEMPORARY ROCK CONSTRUCTION ENTRANCE	EACH	1.00		
Total PARTICIPATING					
102 Project Total					
Grand Total					

Bidder Name: _____

Bidder Address: _____

Bidder Phone: _____

Bidder Signature: _____

Date: _____

TOTALS

	\$
	\$
	\$
	\$
	\$

In accordance with 1210 of the Specifications, receipt is acknowledged of Addendum No. _____ Dated _____
Addendum No. _____ Dated _____ Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

Signed _____

Enclosed herewith find (certified check) (bidder's bond) in the amount of _____
_____ Dollars (\$ _____)

being at least 5% of the amount of the proposal, made payable to the County Treasurer of said county as a proposal guarantee which it is agreed by the undersigned will be forfeited in the event the Form of Contract and Bond is not executed, if awarded to the undersigned.

This Proposal dated the _____ day of _____, _____.

Signed: _____, P.O. Address _____, as an individual.

Signed: _____, for _____, a partnership.

Partners	{ Name _____ Address _____
	{ Name _____ Address _____
	{ Name _____ Address _____
	{ Name _____ Address _____

Signed: _____, for _____

a corporation, incorporated under the laws of the State of _____

Name of President	Business Address
-------------------	------------------

Corporate
Seal

Name of Secretary	Business Address
-------------------	------------------

Name of Treasurer	Business Address
-------------------	------------------

Note: Signatures shall comply with 1206 of the Specifications.

